GREAT RIVER ENERGY
&
MINNESOTA POWER

APPLICATION TO THE
MINNESOTA PUBLIC UTILITIES COMMISSION
FOR A
ROUTE PERMIT

ALTERNATIVE PERMITTING PROCESS

LITTLE FALLS PROJECT

LITTLE FALLS
115 kV TRANSMISSION LINES

Docket ET-2, E015/TL-11-318

GREAT RIVER ENERGY℠
A Touchstone Energy® Cooperative

16 June 2011

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LIST OF ACRONYMS

ACRONYMS	
AC	Alternating current
ACSR	Aluminum conductor steel reinforced
BMPs	Best Management Practices
BPA	Bonneville Power Administration
Commission	Minnesota Public Utilities Commission
Corps	United States Army Corps of Engineers
CWP	Crow Wing Power
dBA	Decibel
DNR	Minnesota Department of Natural Resources
EMF	Electromagnetic fields
EPA	Environmental Protection Agency
EQB	Minnesota Environmental Quality Board
FAA	Federal Aviation Administration
G	Gauss
HVTL	High voltage transmission line
Hz	Hertz
kV	Kilovolt
kV/m	Kilovolts per meter
mG	Milligauss
MHS	Minnesota Historical Society
MISO	Midwest Independent Transmission System Operator
MnDOT	Minnesota Department of Transportation
MP	Minnesota Power
MPCA	Minnesota Pollution Control Agency
MW	Megawatt
NAC	Noise area classifications
NESC	National Electrical Safety Code
NPDES	National Pollutant Discharge Elimination System
NWI	National Wetlands Inventory
OSHA	Occupational Safety and Health Administration
ppm	Parts per million
PWI	Public Water Inventory
RF	Radio frequency
SHPO	State Historical Preservation Office
SWPPP	Stormwater Pollution Prevention Plan
USFWS	United States Fish and Wildlife Service

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Description of Application

Application for a Route Permit for 115 kilovolt (kV) Overhead High Voltage Transmission Lines (HVTL) to Support Increased Load Growth in the Little Falls Area.

Pursuant to Minnesota Statutes Section 216E.04 and Minnesota Rules 7850.2800 to 7850.3900, Great River Energy and Minnesota Power (Applicants) hereby make application to the Minnesota Public Utilities Commission (Commission) for a Route Permit for two overhead 115 kV HVTLs and associated substation modifications in Morrison County, Minnesota (Project) to meet the electrical needs of Great River Energy's member cooperative Crow Wing Power customers located in the Little Falls area. A route permit is required because the proposed HVTLs would be capable of operating at a nominal voltage of more than 100 kV and is greater than 1,500 feet in length.[1] This Application is submitted under the alternative permitting process (see April 11, 2011 letter, Appendix A).[2,3] The proposed HVTLs are less than 10 miles in length (4.35 miles), therefore, a certificate of need is not required.[4]

The Application is divided as follows:

1. **EXECUTIVE SUMMARY** – background information on the Applicants and Crow Wing Power and a brief description of the Project.

2. **INTRODUCTION** – proposed ownership of the HVTLs and associated facilities;[5] the permittees for the Project, discussion of the reason for the Project, eligibility for the alternative permitting process; explanation why a certificate of need is not required and Notice to the Commission.

3. **PROJECT INFORMATION** –Project cost analysis including costs of construction, operation and maintenance.[6]

4. **DESCRIPTION OF THE PROPOSED PROJECT** – detailed description of the proposed Project, including HVTL specification and design and substation specifications;[7] and information on the

[1] *See* Minn. Stat. § 216E.01, Subd. 4.
[2] Letter from Marsha Parlow, Great River Energy to Burl W. Haar, MN PUC. 11 April 2011. *See* Appendix A.
[3] *See* Minn. Stat. § 216E.04 and Minn. R. 7850.1000 and 7850.1300 .
[4] Minn. Stat §§ 216B.2421, subd. 2(3) and 216B.243, subd. 2 requiring a certificate of need for 115 kV lines more than ten miles in length or that crosses a state line.
[5] Minn. R. 7850.1900 subpt. 2(A).
[6] Minn. R. 7850.1900 subpt. 2(K).
[7] Minn. R. 7850.1900 subpt. 2(D).

alternatives considered by the Applicants and reasons they were rejected.[8]

5. **ENGINEERING AND OPERATIONAL DESIGN OF PROPOSED HVTLs** – Project engineering and operational design concepts, including electric and magnetic fields and air quality.[9]

6. **PROPERTY/RIGHT OF WAY ACQUISITION AND RESTORATION** – existing utility and public rights of way along the Proposed Routes,[10] description of right of way requirements, property/right of way acquisition procedures, tree clearing and right of way restoration procedures.[11]

7. **CONSTRUCTION, OPERATION AND MAINTENANCE OF THE HVTLs**–description of the procedures and practices for construction, operation and maintenance of the proposed HVTLs.[12]

8. **ENVIRONMENTAL INFORMATION** – description of the environmental setting, effects on environmental and human resources, and mitigative measures,[13] including identification of land uses and environmental conditions along the Proposed Routes.

9. **AGENCY INVOLVEMENT, PUBLIC PARTICIPATION, AND PERMITS AND APPROVALS NEEDED** – agency contact and public participation opportunities and a list and brief description of possible federal, state and local permits required for the proposed Project.[14]

10. **SUMMARY** – key elements of the Route Permit Application and a comparison to the established factors for consideration in evaluating this Application.[15]

Content requirements of a Route Permit Application are outlined in Minnesota Rules 7850.1900, subpart 2. A Completeness Checklist detailing where information required by rule can be found in this Application is provided in Table 1.

[8] Minn. R. 7850.3100.
[9] Minn. R. 7850.1900 subpt. 2(J).
[10] Minn. R. 7850.1900 subpt. 2(I).
[11] Minn. R. 7850.1900 subpt. 2(M).
[12] Minn. R. 7850.1900 subpt. 2(M).
[13] Minn. R. 7850.1900 subpts. 2(E-F) and 3.
[14] Minn. R. 7850.1900 subpt. 2(N).
[15] Minn. R. 7850.4100.

Table 1 Completeness Checklist

Authority	Required Information	Where
Minn. R. 7850.2800, Subp. 1(C)	Subpart 1. **Eligible Projects**. An applicant for a site permit or a route permit for one of the following projects may elect to follow the procedures of parts 7850.2800 to 7850.3900 instead of the full permitting procedures in parts 7850.1700 to 7850.2700 for high voltage transmission lines of between 100 and 200 kilovolts	2.4
Minn. R. 7850.2800, Subp. 2.	Subpart 2. **Notice to Commission**. An applicant for a permit for one of the qualifying projects in subpart 1, who intends to follow the procedures of parts 7850.2800 to 7850.3700, shall notify the PUC of such intent, in writing, at least 10 days before submitting an application for the project	2.5 & Appendix A
Minn. R. 7850.3100	**Contents of Application** (alternative permitting process) The applicant shall include in the application the same information required in part 7850.1900, except the applicant need not propose any alternative sites or routes to the preferred site or route. If the applicant has rejected alternative sites or routes, the applicant shall include in the application the identity of the rejected sites or routes and an explanation of the reasons for rejecting them	Section 4.4 Figure B-13 (See also 7850.1900, Subp.2 below)
Minn. R. 7850.1900, subp. 2 (applicable per Minn. R. 7850.3100)	**Route Permit for HVTL** (a) a statement of proposed ownership of the facility at the time of filing the application and after commercial operation	Section 2.1
	(b) the precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated	Section 2.2
	c) at least two proposed routes for the proposed high voltage transmission line and identification of the applicant's preferred route and the reasons for the preference	Not applicable, per Minn. R. 7850.3100
	(d) a description of the proposed high voltage transmission line and all associated facilities including the size and type of the high voltage transmission line	Sections 1.2, 4.1, 4.2 Figures B-1, B-2, 1-3, B-5, B-6 to B12, 5-1
	(e) the environmental information required under 7850.1900, Subp. 3	See Minn. R. 7850.1900, subp. 3 (A)-(H) below
	(f) identification of land uses and environmental conditions along the proposed routes	Section 8 Figures B-14 to B-19
	(g) the names of each owner whose property is within any of the proposed routes for the high voltage transmission line	Section 9.2 & Appendix C
	(h) United States Geological Survey topographical maps or other maps acceptable to the chair showing the entire length of the high voltage transmission line on all proposed routes	Figures B-2, 1-3, B-5, B-6 to B-12
	(i) identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share right-of-way with the proposed line	Section 6.1
	(j) the engineering and operational design concepts for the proposed high voltage transmission line, including information on the electric and magnetic fields of the transmission line	Sections 5.1-5.5 Tables 5-1 and 5-2
	(k) cost analysis of each route, including the costs of constructing, operating and maintaining the high voltage transmission line that are dependent on design and route	Section 3.5 Table 3-1

Authority	Required Information	Where
	(l) a description of possible design options to accommodate expansion of the high voltage transmission line in the future	Section 5.3
	(m) the procedures and practices proposed for the acquisition and restoration of the right-of-way, construction and maintenance of the high voltage transmission line	Sections 6.2-6.5 Figure 6-1
	(n) a listing and brief description of federal, state and local permits that may be required for the proposed high voltage transmission line	Section 9.3 Table 9-1
	(o) a copy of the Certificate of Need or the certified HVTL list containing the proposed high voltage transmission line or documentation that an application for a Certificate of Need has been submitted or is not required	Section 2.3 (Not Required)
Minn. R. 7850.1900, subp. 3	**Environmental Information** (a) a description of the environmental setting for each site or route	Section 8.1
	(b) a description of the effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation and public services	Section 5.3 & 8.2 Figure B-14
	c) a description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism and mining	Section 8.3 Figure B-15
	(d) a description of the effects of the facility on archaeological and historic resources	Section 8.4
	(e) a description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna	Sections 8.5 – 8.7 Figures B-15, B-16
	(F) a description of the effects of the facility on rare and unique natural resources	Section 8.5.4 Figure B-17
	(g) identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route	Section 8
	(h) a description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items A to G and the estimated costs of such mitigative measures	Section 8

1. EXECUTIVE SUMMARY

1.1 General

Great River Energy is a not-for-profit generation and transmission cooperative based in Maple Grove, Minnesota. Great River Energy provides electrical energy and related services to 28 member cooperatives, including Crow Wing Power, the distribution cooperative serving the area proposed to be supplied by Great River Energy's new transmission line (Figure 1-1). Great River Energy's distribution cooperatives, in turn, supply electricity and related services to more than 639,000 residential, commercial and industrial customers in Minnesota and Wisconsin.

Great River Energy's 2,800-megawatt (MW) generation system includes a mix of baseload and peaking plants, including coal-fired, refuse-derived fuel, natural gas and oil plants as well as new wind generators. Great River Energy owns approximately 4,500 miles of transmission line in Minnesota, North Dakota, South Dakota and Wisconsin.

Minnesota Power (MP) is an investor-owned public utility headquartered in Duluth, Minnesota. Minnesota Power supplies retail electric service to 136,000 retail customers and wholesale electric service to 16 municipalities in a 26,000-square-mile electric service territory located in northeastern Minnesota (Figure 1-2). Minnesota Power generates and delivers electric energy through a network of transmission and distribution lines and substations throughout northeastern Minnesota. Minnesota Power's transmission network is interconnected with the regional transmission grid to promote reliability.

Great River Energy and Minnesota Power are both members of the Midwest Reliability Organization and the Midwest Independent Transmission System Operator (MISO).

Crow Wing Power (CWP) distributes electricity and related services to approximately 36,000 residential, commercial and industrial customers in Minnesota. Crow Wing Power's wholesale power provider is Great River Energy. Approximately 1,120 residential, commercial and industrial customers of Crow Wing Power in the Little Falls area would benefit from the proposed Project. Minnesota Power has an agreement with Great River Energy to assist in connection to the 115 kV source in the area.

The Applicants' and Crow Wing Power's mission is to provide safe, reliable, competitively priced energy to those they serve. Increasing demand from existing and new electrical services is creating electricity delivery concerns, as the existing electrical system has exceeded its physical limit to reliably deliver electricity to the area consumers.

Figure 1-1 Great River Energy Service Territory

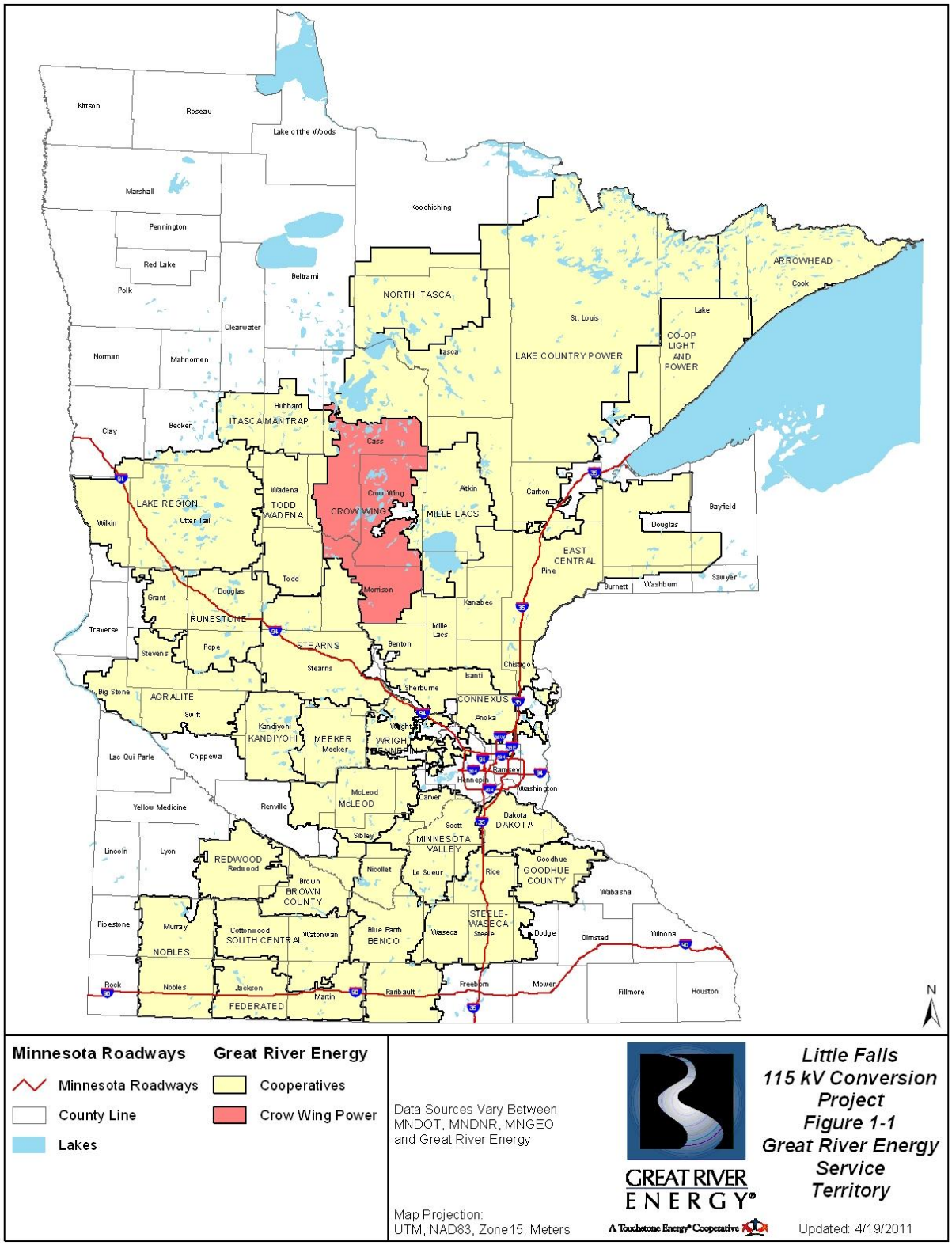
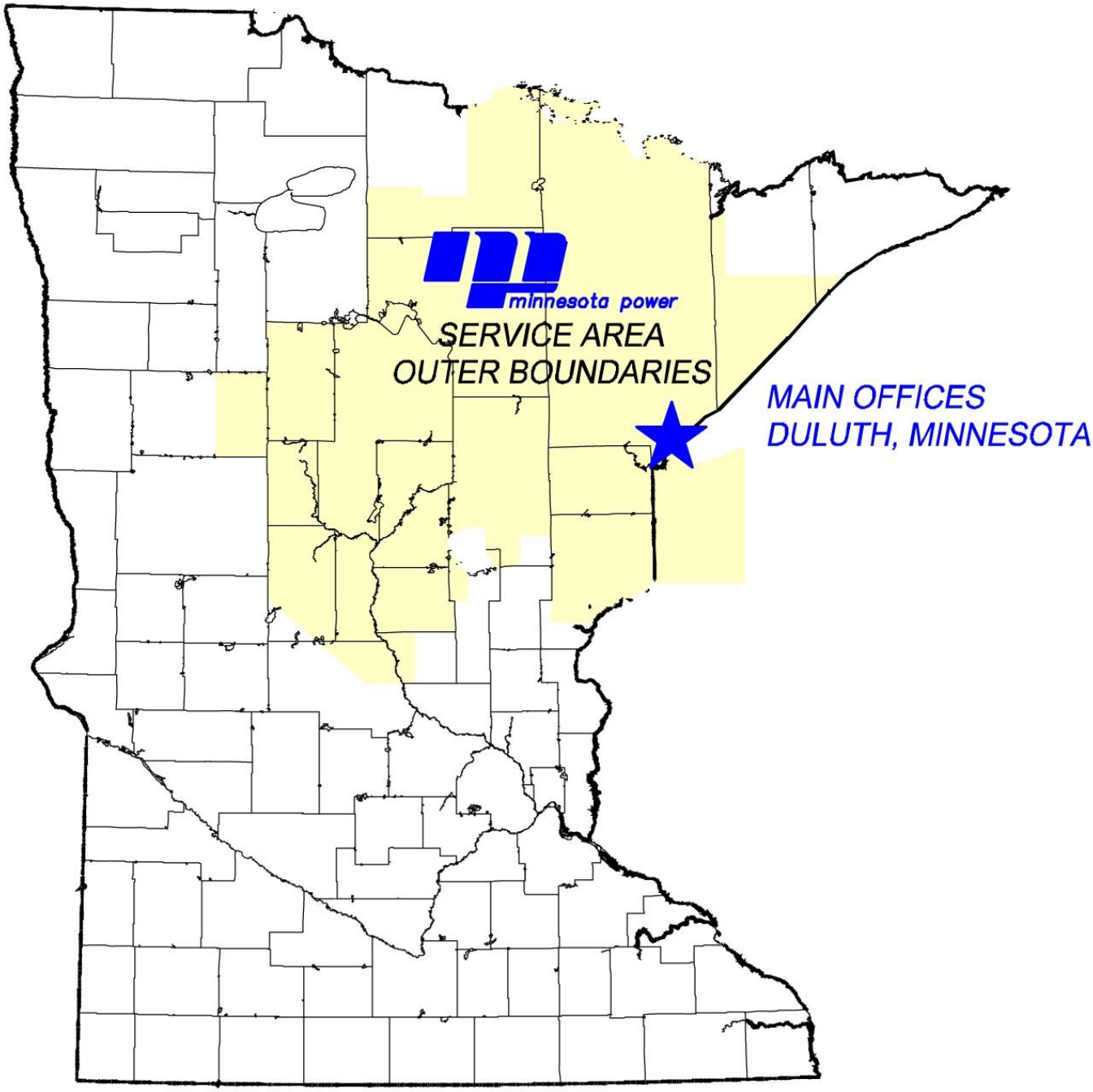


Figure 1-2 Minnesota Power Service Territory



1.2 Description of the Project

The Applicants analyzed the existing power service to the region and determined the existing electrical network has reached its capacity and will be deficient for serving new load growth. To address this deficiency, new transmission lines are required to meet existing and future electric load requirements. See Section 3.1 for further information on studies that determined the need.

The proposed facility additions described below will provide an additional power delivery source into the rural areas east of the City of Little Falls.

1.2.1 Proposed Project

The purpose of the Project is to upgrade Crow Wing Power's distribution substation from a 34.5 kV system to a proposed 115 kV system, which will improve the electrical reliability to Crow Wing Power's members. To supply the upgraded distribution substation, the proposed Project would include ownership transfer of 0.51 mile of Minnesota Power's existing Little Falls to Riverton 115 kV transmission line to Great River Energy; construction of a new 0.51 mile segment of Minnesota Power 115 kV transmission line; and construction of 3.33 miles of new Great River Energy 115 kV transmission line that would be the source to the Crow Wing Power distribution substation. Figures depicting various aspects of the Project are provided in Appendix B.

The proposed Project involves a total of 4.35 miles of transmission line that includes the following components:

- Great River Energy will construct approximately 3.84 miles of new overhead 115 kV transmission line between MP's Little Falls Substation and CWP's Little Falls Substation. For the first 0.51 miles of this transmission line, between MP's Little Falls Substation and the existing MP 46 transmission line, GRE will assume ownership of and rebuild or modify the existing Minnesota Power 115 kV 46 transmission line ("46 line") to accommodate connection to Great River Energy's new transmission line (Figure B-1, Appendix B). Great River Energy will continue from the modified line approximately an additional 3.33 miles of new constructed overhead transmission line to Crow Wing Power's Little Falls Substation (CWP Little Falls Substation) in Section 18 of Little Falls Township (Figure B-2, Appendix B). Along roads, the transmission line poles would be approximately two to five feet outside road right of way.

- As a result of Great River Energy assuming ownership of the existing transmission line outlet from the MP Little Falls Substation, Minnesota Power will construct approximately 0.51 mile of new 115 kV transmission line to reconnect their existing 46 line back to the MP Little Falls Substation The new transmission line would be parallel to the rebuilt

portion of the Great River Energy 115 kV transmission line described above (Figure B-1, Appendix B).

- Great River Energy may remove, upgrade and attach portions of the 2.54 miles of existing Crow Wing Power's overhead and underground 12.5 kV distribution line along 133rd Street and 195th Avenue that share the same side of the road as the proposed transmission line. Where both underground and overhead distribution lines share the same right of way, there is a possibility those lines will be double circuited underneath the proposed transmission line.

- The MP Little Falls Substation will be modified to accommodate reconnection of Minnesota Power's existing 46 line to the MP Little Falls Substation. All modifications would be within the existing fenced area of the substation.

- The CWP Little Falls Substation will be expanded and modified to accommodate Great River Energy's new transmission line. Crow Wing Power will obtain any necessary local approval required beyond this proposed Route Permit.

The proposed route for the new transmission lines is described below and shown in Figure 1-3.

1.2.2 Proposed Route

The first 0.51 mile of the Proposed Route will include a new Great River Energy 115 kV line (assume ownership and rebuild a section of the 46 line) and a new Minnesota Power 115 kV transmission line that will be located approximately 62 to 66 feet north of the existing 46 line.

The Proposed Route exits the east side of the MP Little Falls Substation. Two parallel line segments will run east approximately 0.51 mile. The Minnesota Power segment will connect at the existing 46 line. The Great River Energy portion will continue east approximately 0.29 mile cross country, south 0.5 mile along 180th Avenue, east approximately 1.54 miles along County Road 256 and 133rd Street, and north approximately 1.0 mile along 195th Avenue to the CWP Little Falls Substation.

Existing Crow Wing Power overhead 12.5 kV distribution lines (approximately 2.54 miles along 133rd Street and 195th Avenue) may be attached to the new transmission line. There are both overhead and underground distribution lines along the route proposed that may be attached to the new 115 kV transmission line structures. Where both underground and overhead distribution lines share the same right of way, there is a possibility those lines will be double circuited underneath the proposed transmission line.

The route width proposed is 300 feet wide, 150 feet on each side of the proposed route centerline (Figure B-3, Appendix B). The Great River Energy easement will be 50 feet on each side of the transmission centerline in most areas, or 60 feet on each side if specialty structures, such as H-frame or braced post, are used. The Minnesota Power right of way will be 50 feet on each side of the transmission centerline.

Figure 1-3 Proposed Project Route

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2. INTRODUCTION

2.1 Proposed Ownership

Great River Energy will own approximately 3.84 miles of single circuit 115 kV overhead transmission line that will proceed from the existing MP Little Falls Substation east, south, east and then north to the existing CWP Little Falls Substation.

Minnesota Power will own approximately 0.51 miles of single circuit 115 kV overhead transmission line that will proceed from the existing MP Little Falls Substation east to Minnesota Power's existing 46 line.

Great River Energy will have a permanent easement for the high voltage (115 kV) transmission facilities and control building (for metering, instrumentation, telecommunications and the battery bank) that it will own and operate separately at the MP Little Falls Substation and the CWP Little Falls Substation.

2.2 Permittees

Great River Energy and Minnesota Power will be named as permittees for this Project. Transfer of the permit to any other person or organization is not anticipated.

Contact information for the Applicants is provided below.

Permittee:	Great River Energy 12300 Elm Creek Blvd. Maple Grove, Minnesota 55369	Minnesota Power 30 West Superior Street Duluth, Minnesota 55802
Contact:	Marsha Parlow Transmission Permitting Analyst Environmental Services	Dan McCourtney Environmental Compliance Specialist II
Phone:	(763) 445-5215	(218) 355-3515
Email:	mparlow@grenergy.com	dmccourtney@allete.com

2.3 Certificate of Need Not Required

Minn. Stat. § 216B.243, subd. 2, states that "[n]o large energy facility shall be sited or constructed in Minnesota without the issuance of a certificate of need by the Public Utilities Commission..." A large energy facility is defined in part as "any high-voltage transmission line with a capacity of 100 kilovolts or more with more than ten miles of its length in Minnesota or that crosses a state line."[16] The proposed Little Falls Project is less than ten miles in length and does not cross a state line; therefore a certificate of need is not required.

2.4 Eligibility for the Alternative Permitting Process

The Little Falls Project involves construction of one rebuild and two new 115 kV transmission lines, including approximately 0.51 mile of rebuild, and modification of existing substation facilities. Because the proposed transmission line Project is between 100 kV and 200 kV, it is eligible for review under the alternative permitting process authorized by Minn. Stat. § 216E.04, subd. 2(3) and Minn. Rules 7850.2800, subp. 1(C). The Applicants request that the Project be considered for review under the alternative permitting process

The permit application requirements are listed in Table 1. This table includes cross-references indicating the location of required information contained within the Little Falls Project Route Permit Application.

2.5 Notice to the Commission

The Commission was notified by a letter dated and e-filed April 11, 2011, that the Applicants intended to utilize the alternative permitting process for the proposed Little Falls Project.[17] This notice complies with the requirement to notify the Commission at least ten days prior to submission of an application.[18] A copy of this letter is included in Appendix A.

[16] Minn. Stat. § 216B.2421, subd. 2(3).
[17] Minn. Stat. § 216E.04 and Minn. R. 7850.2800.
[18] Minn. R. 7850.2800, subpt. 2.

3. PROJECT INFORMATION

3.1 Project Purpose

The Project is being proposed to address low voltage and equipment overload concerns that threaten to jeopardize reliable electrical service to consumers in the rural areas east of U.S. Highway 10 and Minnesota State Highway 371, including the cities of Pierz, Genola, Lastrup, and Buckman (Figure 3-1). The need of this project has been addressed in multiple documents.[19] [20] [21] If voltage cannot be maintained within acceptable limits, electrical appliances and lighting will not perform as expected and could potentially be damaged. Additionally, overloaded equipment is susceptible to failure, which could lead to long-term outages if switching cannot be performed to restore service

3.1.1 Transmission System Description

The largely rural east side of Little Falls is presently served from the 34.5 kV system sourced from the Minnesota Power - owned Little Falls, Blanchard and Platte River 115/34.5 kV substations (Figure B-4, Appendix B). These sources are tied together with over 50 miles of 34.5 kV sub-transmission line that serve the local area substations.

The 34.5 kV system that serves the area cannot maintain acceptable system voltages when energized solely from the Blanchard and Platte River substations under peak system conditions. Furthermore, there are several sections of 34.5 kV line and three voltage-regulating devices that overload under these conditions. The risk for brownouts and overloaded equipment is expected to become greater with continued growth in system demand.[19] [20] [21]

3.2 Project Location

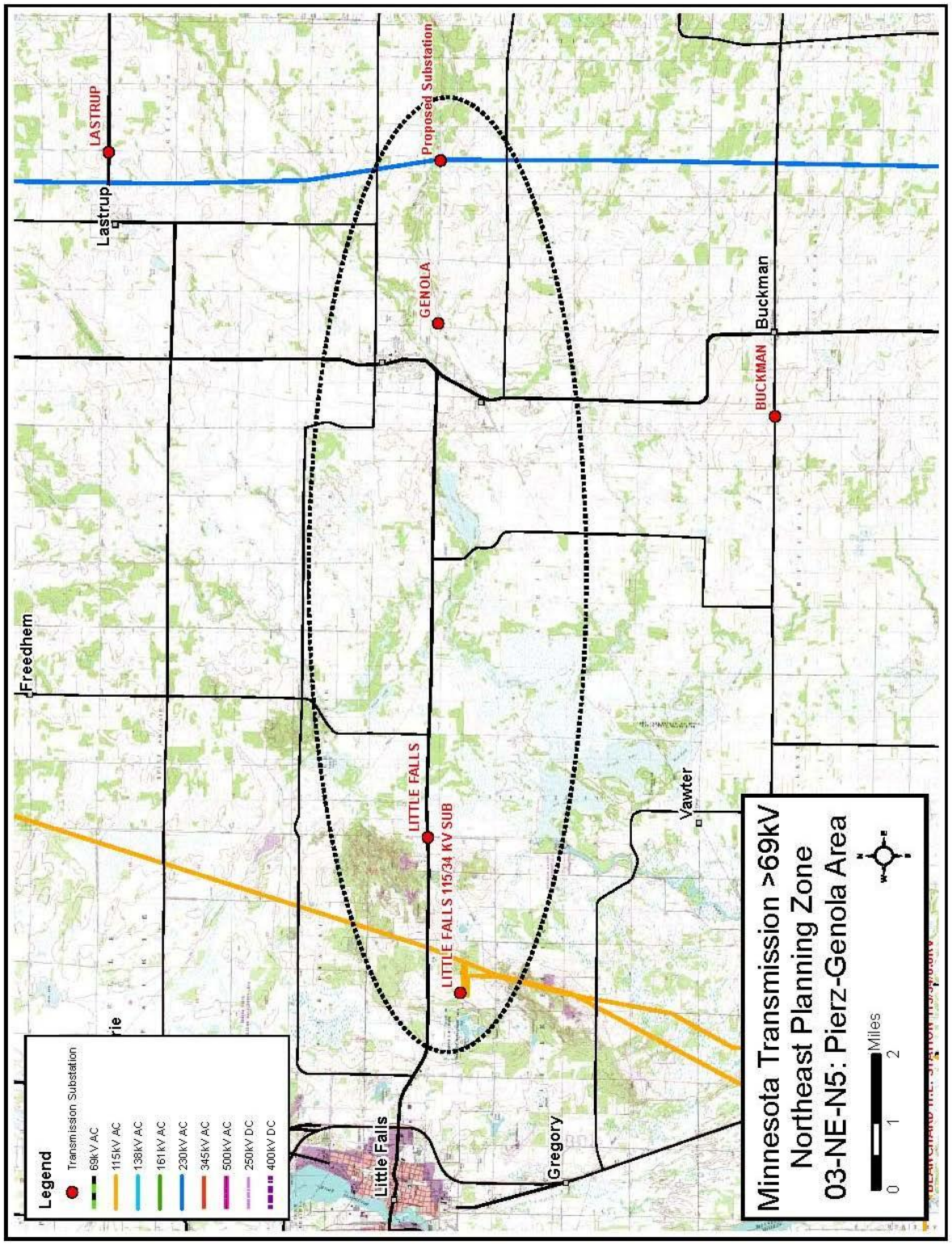
The proposed Little Falls 115 kV Project is located east of Little Falls in Little Falls Township, Section 18, T40N, R30W and Sections 13 and 14, T40N, R31W, Morrison County, Minnesota (Figure B-5, Appendix B and Figure 1-3).

3.3 Project Schedule

Construction is expected to begin on the Little Falls Project in mid-2012. An in-service date of November 30, 2012, is anticipated.

[19] Midwest ISO Transmission Expansion Plan 2010, Project 1018
[20] Great River Energy 2008 Long Range Plan – Pages C13-C15
http://www.greatriverenergy.com/deliveringelectricity/planningforthefuture/doc083180.pdf
[21] Great River Energy 2007 Biennial Plan, Section 7-7.36 Pierz-Genola Area – Tracking Number 2003 – NE N5, http://www.minnelectrans.com/documents/2007_Biennial_Report/Part_I-Section_7-3.pdf

Figure 3-1 Transmission Expansion Plan



3.4 Project Cost Analysis

3.4.1 Project Costs

Estimates for the proposed transmission lines are divided into three categories: pre- and post-construction; construction; and operation and maintenance costs. Pre- and post-construction costs include expenditures for permitting, surveying (land and cultural resources), right of way acquisition, right of way clearing and right of way restoration. Construction costs include substation modifications and transmission line construction. The Applicants and Crow Wing Power also evaluate the operation and maintenance costs associated with the Project after it is placed in service.

3.4.2 Pre- and Post-Construction Costs

Pre-construction costs include labor and expenses for preparation and approval of the Application, public information meetings, public hearings, any required natural resource or cultural resource surveys, licensing or permitting fees, easement and land acquisition for approximately 4.35 miles of transmission line right of way, and the cost of right of way clearing. Post-construction costs include the restoration and re-vegetation of disturbed soils after construction of the Project is complete.

3.4.3 Construction Costs

Transmission line costs vary depending on the structure type, the number of structures per mile (i.e. span length), the height and diameter of the wood poles, labor and hardware costs. Line construction costs include the cost of structures, insulators, conductors, bird flight diverters where necessary and labor as well as any costs of equipment that will be used to construct the new line and modify the substations.

Single pole with underbuild construction costs are approximately $430,000 per mile including removal of the existing distribution and transferring to the new poles. H-Frame and single pole (without underbuild) costs are approximately $340,000 per mile. The single pole structures with underbuild would be more expensive because of additional costs incurred by removing the existing lower voltage circuit distribution and reattaching it to the new poles and the need for shorter average spans, resulting in more structures per mile.

Estimated Project costs are shown in Table 3-1.

Table 3-1 Estimated Project Costs (2011 Dollars)

Owner	Route	Estimated Pre- and Post-Construction Costs $	Estimated Construction Costs - 115 kV Transmission Line $	Estimated Substation Modification Costs $	Total Project Cost $
Great River Energy	Proposed Route (3.84 miles)	329,000	1,316,000	NA	1,645,000*
Minnesota Power	Proposed Route (0.51 mile)	NA	276,000	311,000	587,000
Crow Wing Power	NA	NA	NA	600,000	600,000
Total	4.35 miles	329,000	1,592,000	911,000	2,832,000

*Estimated Project costs will be lower where existing distribution lines are not underbuilt.

All costs for the transmission lines and MP Little Falls Substation modifications will be borne by the Applicants. The CWP Little Falls Substation modification costs will be borne by Crow Wing Power.

3.4.4 Operation and Maintenance Costs

Operation and maintenance costs associated with both Little Falls substations will be minimal, other than weed control inside the substations.

The estimated annual cost of right of way maintenance is between $500 and $750 per mile of transmission line.

In addition to these right of way maintenance costs, annual operating and maintenance costs associated with 115 kV transmission lines in Minnesota currently average about $600 per mile. Storm restoration, annual inspections and ordinary replacement costs are included in these annual operating and maintenance costs.

4. PROJECT ANALYSIS

The Applicants are proposing the following transmission Project in the Little Falls area:

- Great River Energy will construct approximately 3.84 miles of new overhead 115 kV transmission line between the MP Little Falls Substation in Section 14 of Little Falls Township and the CWP Little Falls Substation in Section 18 of Little Falls Township.

- For the first 0.51 mile of the 3.84 miles (closest to MP Little Falls Substation) Great River Energy will rebuild or modify and assume ownership of a portion of the existing Minnesota Power 46 line.

- Minnesota Power will construct approximately 0.51 mile of new transmission line to reconnect to their existing 46 line back to the MP Little Falls Substation.

- Great River Energy may remove, upgrade and attach all or a portion of the 2.54 miles of existing Crow Wing Power overhead and underground 12.5 kV distribution line along 133rd Street and 195th Avenue. Where both underground and overhead distribution lines share the same right of way, there is a possibility those lines will be double circuited underneath the proposed transmission line.

- The MP Little Falls Substation will be modified to accommodate the reconfigured 46 Line.

- The CWP Little Falls Substation will be expanded and modified to accommodate Great River Energy's new transmission line.

These transmission improvements are discussed in more detail below.

4.1 Transmission Lines

4.1.1 Route Selection Process

The proposed 4.35 miles of overhead 115 kV transmission line were reviewed during the electrical planning process by a team comprised of transmission planning, right of way, environmental and engineering design personnel (siting team). The siting team reviewed the general Project area for significant routing and siting issues that may arise, as well as any electric system performance issues associated with the various route alternatives. Route alternatives were identified using the process described below with a Proposed Route selected for this Application in accordance with Minnesota Rules 7850.3100. Rejected route alternatives are discussed in Section 4.4.

4.1.2 Route Selection Criteria

The siting team analyzed the Project area using various geographic data (e.g., aerial photos, topographic maps, public water inventory maps, etc.) and input from local government representatives and the public. Preliminary route options were then identified based on opportunities to:

- Parallel roads to help decrease the amount of right of way required;
- Reduce impacts to the reliability of existing transmission systems during construction;
- Share right of way with existing transmission and distribution lines by underbuilding where practical; and
- Minimize the length of the transmission line to reduce the impact area and costs for the Project.

The routes were further refined by avoiding, to the extent possible and applicable, areas where a transmission line could create significant impacts such as:

- Existing residential structures near the proposed route options;
- Areas where horizontal clearances are limited because of trees or nearby structures;
- Environmentally sensitive sites, such as wetlands, archaeologically significant sites, areas with threatened or endangered species/species of special concern, areas of significant biological or cultural significance and state and federal lands; and
- "Severing" parcels rather than following property or field division lines.

4.1.3 Proposed Route

The Proposed Route for which the Applicants are requesting a permit from the Commission exits the east side of the MP Little Falls Substation. Two parallel line segments will run east approximately 0.51 mile. The Minnesota Power segment terminates at the existing 46 line. The Great River Energy portion continues east approximately 0.29 mile cross country, south 0.5 mile along 180th Avenue, east approximately 1.54 miles along County Road 256 and 133rd Street, and north approximately 1.0 mile along 195th Avenue to the CWP Little Falls Substation as shown in Figures B-6 to B-12 (Appendix B).

4.1.4 Route Width Requested

The Applicants request that the Commission approve a 300-foot route that extends 150 feet on either side of the portion of MP 46 line that runs east from the MP Little Falls Substation, its easterly extension to 180th Avenue, and road centerlines to allow flexibility to incorporate route selection criteria and to

accommodate environmental concerns. The Great River Energy right of way will be 50 feet on each side of the Great River Energy transmission centerline in most areas, or 60 feet on each side if specialty structures, such as H-frame or brace post are used. The Minnesota Power right of way will be 50 feet on each side of the transmission centerline. The requested route width will be sufficient to construct both Great River Energy and Minnesota Power lines in the first 0.51 mile.

4.2 Substation Modifications

The existing MP Little Falls Substation (Figure B-6, Appendix B) is located in Section 14, Township 40N, Range 32W in Little Falls Township. Minnesota Power will construct a new bay and breaker to accommodate the new 115 kV line constructed to reconnect Minnesota Power's 46 Line. The MP Little Falls Substation fence line will not change and no additional grading will be required.

The existing CWP Little Falls Substation (Figure B-12, Appendix B) is located in Section 18, Township 40N, Range 31W in Little Falls Township. Crow Wing Power will replace the transformer and associated equipment to accommodate the new 115 kV to 12.5 kV voltage change. Crow Wing Power is considering expansion of their CWP Little Falls Substation fence line and purchasing additional land approximately 50 feet south of the existing substation.

The Applicants will own and operate all the high voltage (115 kV) transmission facilities, the control building (which contains metering and telecommunications equipment), instrumentation and the battery bank.

4.3 Design Options to Accommodate Future Expansion

The Project is designed to maintain necessary reliability requirements in the area and is sized to accommodate electric demand growth and future electrical system configurations, including additional substations and/or transmission lines that may be needed to continue to provide a reliable electrical system. The CWP Little Falls Substation is the largest substation served from the Little Falls-Platte River-Blanchard 34.5 kV transmission loop. The conversion to 115 kV will greatly extend the life of the 34.5 kV system and provide loading relief to the voltage regulators. This Project would also be a start of a long range plan (10 to 15 years) to establish a 115 kV path between the Little Falls area and a new Pierz 230/115 kV source to help with bulk system voltage support.

4.4 Alternative Routes Considered and Rejected

Minnesota permitting rules require that if any alternative routes or sites have been rejected "… the applicant shall include in the application the identity of the rejected sites or routes and an explanation of the reasons for rejecting them." [22]

[22] Minn. R. 7850.3100.

Alternatives to the Proposed Route that were evaluated by the Applicants are described below and shown on Figure B-13 (Appendix B).

The two alternative routes evaluated were reviewed and analyzed both in the field and using aerial photography and land-based maps that show natural features such as lakes, streams and wetlands. The routes that followed existing right of way corridors were preferred to cross-country routes.

4.4.1 Northern Alternative Route

The northern alternative route exited the east side of the MP Little Falls Substation, ran east along an existing transmission line for approximately 0.51 miles, continued northeast along the Minnesota Power 46 115 kV transmission line for approximately one mile, and turned east along State Highway 27 (MN 27) for approximately 1.6 miles to the CWP Little Falls Substation.

In this scenario, Great River Energy would double circuit the new transmission line with Minnesota Power's 46 line up to MN 27 and continue east double circuiting the new transmission line with Minnesota Power's 34.5 kV 526 line. Minnesota Power would have to reestablish connection of their 46 line between MP Little Falls Substation and the break at MN 27, and reestablish connection of their 34.5 kV 526 line along MN 27.

This route was rejected based on the congestion of transmission lines in the area and proximity to homes along MN 27. Double circuiting the existing 34.5 kV circuit or building on the opposite side of MN 27 would be likely configurations for constructing the proposed line along this route. Double circuiting would not necessarily result in increased reliability due to the potential for the outage of both circuits upon failure of the poles that support the circuits. This route would also involve complex timing of outages to install the new transmission line.

4.4.2 Cross Country Alternative Route

The cross country alternative route exited the east side of the MP Little Falls Substation. Two parallel line segments would run east approximately 0.51 mile. The Minnesota Power segment would terminate at the existing 46 line. The Great River Energy portion would continue east approximately 0.29 mile cross country to 180th Avenue, continue east 1.54 miles cross country to 195th Avenue, and turn north 0.5 mile to CWP Little Falls Substation.

In this scenario, the first 0.51 mile would be similar to the proposed Project where Great River Energy would assume ownership and modify or rebuild the first 0.51 mile of the 46 line and continue with the rest of the route, and Minnesota Power would build 0.51 mile of new line to reconnect the MP Little Falls Substation back to the 46 line.

However, the cross country portion of this alternative was rejected because it would sever private property, there was poor road access and it would cross a public water east of the MP Little Falls Substation.

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5. ENGINEERING AND OPERATIONAL DESIGN OF THE PROPOSED HVTLS AND EXISTING SUBSTATIONS

5.1 Transmission Structures

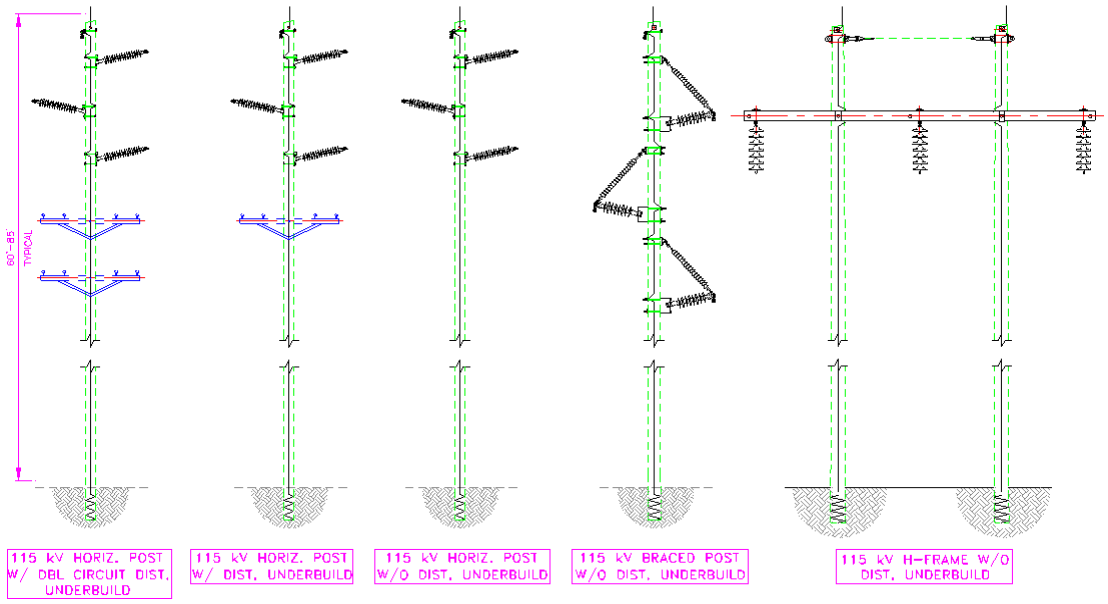
Design voltage of the proposed transmission lines is 115 kV. Total length of the Project is approximately 4.35 miles, with slight variations depending on the exact route chosen. The proposed lines and the existing substations are within Morrison County, Minnesota.

Great River Energy's transmission line would be constructed with 795 aluminum conductor steel reinforced (ACSR). The line would use three single conductors (not bundled).

Minnesota Power's transmission line would be constructed with 636 ACSR. The line would use three single conductors (not bundled).

Typical structure types to be used for this Project are shown in Figure 5-1.

Figure 5-1 Schematic Diagrams of Typical Structures



Single pole wood structures with horizontal post insulators will be the primary structure used for the Project. Horizontal post insulators will be used unless design requires longer spans beyond the capability of the insulators, in which case a braced post design will be utilized to accommodate the increased loadings. Angles in the line will require guying (the use of anchors and support

cables) or specialty structures. Where guying is not practicable, direct embedded laminated wood poles or steel poles on drilled pier concrete foundations will be utilized.

The Great River Energy single circuit structures will have three single conductor phase wires and one shield wire. The phase wires will be 795 thousand circular mil ACSR with seven steel core strands and 26 outer aluminum strands. The shield wire will be 0.465 optical ground wire. The average span length will be approximately 300-400 feet and structure heights will range from 60 to 85 feet above ground. Structures, pole heights and spans will vary depending upon topography and environmental constraints (such as highway crossings, stream crossings, and required angle structures). The proposed ROW easement width is 50 feet on each side of the transmission centerline.

Single pole with underbuild design may be used in areas where the new Great River Energy transmission line may overtake all or a portion of Crow Wing Power distribution lines along 133rd Street and 195th Avenue. The advantage of this design (over two separate lines on either side of the road) is that less right of way is required. However, these structures would be taller because the higher voltage circuit is "stacked" on top of the lower voltage circuit, resulting in a pole that averages 70 to 85 feet in height. Span lengths would average 250 to 300 feet compared to 300 to 400 feet with no underbuild.

H-Frame design structures will be used on Minnesota Power's 0.51 mile portion and may be used on some of Great River Energy's portion of the Project. Structure heights will range from 60 to 80 feet with taller structures required for exceptionally long spans and in circumstances requiring additional vertical clearance exceeding National Electrical Safety Code (NESC) and other agency requirements. The proposed ROW easement width is 50 feet on each side of the transmission centerline.

The average diameter of the wood poles (both single post and H-frame) at ground level is 20 inches.

5.1.1 Construction Considerations

Clearances

The transmission lines will be designed to meet the NESC and the Institute of Electrical and Electronics Engineers standards. The NESC recommends minimum safety standards for clearances over roadways, buildings, signs, light standards, and other facilities.

The Applicants have company standards that meet or exceed the NESC requirements. Clearances over highways and roadways will exceed the 20.1 feet recommended by the NESC. Although the NESC gives recommended clearances over buildings, the Applicants generally do not locate transmission

lines directly over a building unless it cannot be avoided. Horizontal clearances to buildings, signs, light standards, and other installations will be determined by calculating the blowout of the wire, structure deflection, and safe electrical clearance from the line.

5.1.2 Material Requirements

Construction of the transmission lines will require the use of renewable, recycled and non-renewable resources. The renewable resources consist of the wooden poles, the recycled resources consist of conductors and shield wires, and the non-renewable resources consist of insulators, and related hardware.

5.2 Substation Modifications

The proposed Project involves upgrade of the MP Little Falls Substation and CWP Little Falls Substation. Minnesota Power will own all common substation facilities (land, fence, etc.) at the MP Little Falls Substation. Great River Energy will have a permanent easement for its transmission facilities on the MP Little Falls Substation property. Crow Wing Power will own all common substation facilities (land, fence, etc.) at the CWP Little Falls Substation and will operate the low voltage distribution facilities. Great River Energy will have a permanent easement for its transmission facilities on the CWP Little Falls Substation property.

The proposed Project will require these additional components:

- One bay and breaker and associated equipment at the MP Little Falls Substation to accommodate connection of an additional 115 kV transmission line at the MP Little Falls Substation
- One 115 to 12.5 kV transformer to accommodate the 115 kV transmission line termination at the CWP Little Falls Substation

Applicants will own and operate their respective high voltage (115 kV) facilities and control buildings. All the work at Minnesota Power's site should be within the existing substation. Crow Wing Power's site is proposed to expand approximately 50 feet south and would involve some grading activity. Crow Wing Power will obtain any necessary local approval required beyond this proposed Route Permit.

5.3 Electric and Magnetic Fields

The term "EMF" refers to electric and magnetic fields that are coupled together such as in high frequency radiating fields. For lower frequencies such as for power lines, EMF should be separated into electric fields and magnetic fields. HVTLs operate at a frequency of 60 hertz (Hz) (cycles per second), which is in the non-ionizing portion of the electromagnetic frequency spectrum. Fields are

considered ionizing when they cause electrons to eject from their orbits around a normal atom, which typically occurs in frequency ranges of 10^{16} to 10^{22} Hz.

5.3.1 Electric Fields

The transmission line voltage generates an electric field, but the magnitude of the electric field rapidly decreases with distance from the conductor. The electric field is expressed in a unit of volts per meter. Although there is no state or federal standard for transmission line electric field exposures, the Minnesota Environmental Quality Board (EQB) developed a standard of a maximum electric field limit of 8 kilovolts per meter (kV/m) at one meter above ground. That standard, which has been used by the Commission in routing assessments, was implemented to mitigate serious hazard from shocks when touching large objects parked under transmission lines with voltage of 500 kV or greater.

Table 5-1 summarizes the electric fields calculated for the Project during the 115 kV operation of both the Great River Energy and Minnesota Power transmission lines. The table includes several scenarios, horizontal post without distribution underbuild, horizontal post with single circuit underbuild, and horizontal post with double circuit underbuild.

5.3.2 Magnetic Fields

Magnetic fields result from the flow of electricity (current) in the transmission line. The intensity of the magnetic field is related to the current flow through the conductors. The magnetic field associated with the transmission line surrounds the conductor and rapidly decreases with the distance from the conductor. The value of the magnetic field density is expressed in the unit of gauss (G) or milligauss (mG). Recent studies of the health effects from power frequency fields conclude that the evidence of health risk is weak.[23]

Table 5-2 summarizes the magnetic fields calculated for the Project (same scenarios as Table 5-1) during the 115 kV operation of the transmission lines.

[23] Minnesota Department of Health. *EMF White Paper on Electric and Magnetic Field* (EMF) Policy and Mitigation Options. 2002; National Research Council. *Possible Health Effects of Exposure to Residential Electric and Magnetic Fields*. 1997; www.niehs.nih.gov/health/topics/agents/emf/.

Table 5-1 Calculated Electric Fields (kV/m) for Proposed 115 kV Transmission Line Designs (3.28 feet above ground)

Scenario	Maximum Operating Voltage (kV)	Distance to Proposed Centerline										
		-300'	-200'	-100'	-50'	-25'	Max.	25'	50'	100'	200'	300'
Horizontal Post Operation No Distribution Underbuild Average Load	121	0.01	0.02	0.06	0.22	0.47	1.30	0.66	0.20	0.07	0.02	0.01
Horizontal Post Operation No Distribution Underbuild Emergency Load	121	0.01	0.02	0.06	0.22	0.47	1.30	0.66	0.20	0.07	0.02	0.01
Horizontal Post Operation with Single Circuit Distribution Underbuild Average Load	121	0.01	0.02	0.07	0.20	0.27	0.42	0.37	0.17	0.07	0.02	0.01
Horizontal Post Operation with Single Circuit Distribution Underbuild Emergency Load	121	0.01	0.02	0.07	0.20	0.27	0.42	0.37	0.17	0.07	0.02	0.01
Horizontal Post Operation with Double Circuit Distribution Underbuild Average Load	121	0.01	0.02	0.07	0.18	0.20	0.29	0.27	0.15	0.07	0.02	0.01
Horizontal Post Operation with Double Circuit Distribution Underbuild Emergency Load	121	0.01	0.02	0.07	0.18	0.20	0.29	0.27	0.15	0.07	0.02	0.01

Note: The maximum electric field in the Applicants' proposal is 1.30 kV/m at 5 foot offset from centerline, which is well under the maximum limit of 8 kV/m that has been a permit condition imposed by EQB in other transmission line routing proceedings.

Table 5-2 Calculated Magnetic Fields (mG) for Proposed 115 kV Transmission Line Designs (3.28 feet above ground)

Scenario	Maximum Operating Voltage (kV)	Distance to Proposed Centerline										
		-300'	-200'	-100'	-50'	-25'	Max.	25'	50'	100'	200'	300'
Horizontal Post Operation No Distribution Underbuild Average Load	121	0.06	0.13	0.46	1.43	3.17	5.96	3.71	1.63	0.50	0.13	0.06
Horizontal Post Operation No Distribution Underbuild Emergency Load	121	1.20	2.64	9.71	30.33	67.09	126.16	78.54	34.45	10.51	2.75	1.23
Horizontal Post Operation with Single Circuit Distribution Underbuild Average Load	121	0.07	0.14	0.48	1.45	3.88	10.58	5.94	2.45	0.70	0.18	0.08
Horizontal Post Operation with Single Circuit Distribution Underbuild Emergency Load	121	1.18	2.54	8.70	23.10	41.97	90.92	65.95	32.65	10.68	2.84	1.27
Horizontal Post Operation with Double Circuit Distribution Underbuild Average Load	121	0.08	0.16	0.58	1.68	3.51	6.48	4.18	1.96	0.65	0.18	0.08
Horizontal Post Operation with Double Circuit Distribution Underbuild Emergency Load	121	1.30	2.82	9.79	26.66	49.68	72.55	52.65	29.11	10.56	2.95	1.34

Note: The maximum magnetic field for the Little Falls Project is 126.16 mG at 5 foot offset from centerline.

5.3.3 Summary

The proposed 115 kV line will have a maximum magnitude of electric field density of approximately 1.30 kV/m underneath the conductors, one meter above grade (Table 5-1), which is well below the maximum limit of 8 kV/m that has been a permit condition imposed by the EQB in other transmission line routing proceedings. Research on the biological effects from electric fields on animals and humans has shown no significant association with disease in humans.

The maximum magnetic field for the Little Falls Project is 126.16 mG (five feet from centerline) for the 115 kV without distribution, maximum loading scenario (Table 5-2).

5.4 Ozone and Nitrogen Oxide Emissions

Corona, which may produce ozone and oxides of nitrogen, consists of an ionic or electrical discharge from the surface of a transmission line conductor. It occurs when the electric field intensity or surface gradient on the conductor exceeds the breakdown strength of air. For a 115 kV transmission line, the conductor surface gradient is usually below the air breakdown level. Some imperfection, such as loose conductor support hardware or water droplets, is necessary to cause corona. When corona occurs, it will be within a few centimeters or less immediately surrounding a conductor. Ozone also forms naturally in the lower atmosphere from lightning discharges and from reactions between solar ultraviolet radiation and air pollutants such as hydrocarbons from auto emissions.

The natural production rate of ozone is directly proportional to temperature and sunlight and inversely proportional to humidity. Therefore, humidity (or moisture), the same factor that increases corona discharges from transmission lines, inhibits the production of ozone. Ozone is a very reactive form of oxygen and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, ozone is relatively short-lived.

On July 18, 1997, the Environmental Protection Agency (EPA) promulgated a regulation (62 Federal Register 38856) replacing the 1-hour ozone 0.12 parts per million (ppm) standard with an 8-hour standard of 0.08 ppm. The form of the 8-hour standard is based on the 3-year average of the annual fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area. Calculations using the BPA *Corona and Field Effects Program Ver. 3*[24] for a standard single circuit 115 kV project predicted a maximum concentration of 0.006 ppm near the conductor and 0.002 ppm at one meter above ground during foul weather or worst case conditions with rain at one inch per hour. During a mist (rain at 0.01 inch per hour) the maximum concentrations decreased to 0.0002 ppm near the conductor and 0.0001 ppm at one meter above ground level. For both cases, the ozone levels are below EPA standards.

[24] United States Department of Energy, Bonneville Power Administration. Corona and Field Effects Program Version 3.0 Computer Program. Vancouver, WA.

Most calculations for the production and concentration of ozone assume high humidity or rain with no reduction in the amount of ozone due to oxidation or air movement. These calculations would therefore overestimate the amount of ozone that is produced and concentrated at ground level. Studies designed to monitor the production of ozone under transmission lines have generally been unable to detect any increase due to the transmission line facility.

6. PROPERTY/RIGHT OF WAY ACQUISITION AND RESTORATION

6.1 Identification of Existing Utility and Public Rights of Way

6.1.1 Utility Rights of Way

Great River Energy is proposing to assume ownership of a 0.51 mile portion of the existing Minnesota Power 46 line.

Great River Energy may remove and underbuild a portion or all of the existing Crow Wing Power distribution lines (approximately 2.54 miles) along 133rd Street and 195th Avenue on the new 115 kV transmission line. There are both overhead and underground distribution lines along the route that may be attached to the new 115 kV transmission line structures. Where both underground and overhead distribution lines share the same right of way, there is a possibility those lines will be double circuited underneath the proposed transmission line.

If the Commission directs Great River Energy to overtake the same centerline as Crow Wing Power's existing facilities, the existing distribution lines would be removed, upgraded and attached to the new transmission line structures.

Two parallel eight-inch Northern Natural Gas pipelines in the Project area would be crossed twice by the proposed Great River Energy transmission line (see Figure B-5, Appendix B). Great River Energy will work with the pipeline owner and perform reasonable testing at Great River Energy's cost to identify any potential corrosion issues. Corrosion mitigation will be done if determined necessary as a result of the testing.

6.1.2 Public Road Rights of Way

The Proposed Route would parallel public road rights of way for the majority (3.04 miles or 79 percent) of the 4.35 miles (approximately 0.5 mile along 180th Avenue, 1.54 miles along County Road 256 and 133rd Street, and one mile along 195th Avenue). Applicants anticipate that where the route follows existing roads, the centerline will be approximately two to five feet outside the road right of way allowing the transmission line and roadway rights-of-way to partially overlap.

6.2 Right of Way Requirements

Generally, a 100-foot wide right of way (50 feet on each side of the transmission centerline) is proposed for construction of each of the transmission lines. Along roads, the transmission line structures will be placed approximately two to five feet outside of the road right of way and a portion of the right of way would overlap with road right of way. In areas where the transmission line is along a road, the easement required would be approximately 52 feet to 55 feet wide.

Additional right of way may be required for longer spans, for guy wires and anchors, or special design requirements based on final survey.

6.3 Property/Right of Way Acquisition Procedures

Should a route permit be issued by the Commission, land rights acquisition will commence subsequent to survey and preliminary determination of the transmission centerlines. Land rights acquisition includes easement acquisition in the case of a transmission line, or acquisition of a fee interest in the case of a substation expansion. As a general practice, landowners will be notified of the initial phase of the transmission Project, including survey and soil investigation. Upon completion of the survey and preliminary design, landowners will be contacted to discuss Project details, including the proposed transmission centerline, and easement/fee acquisition negotiations will commence.

During the acquisition phase of the Project, landowners are given a copy of the conveyance documents generally including a copy of the route permit, easements, deeds, structure design or photos, an offer of compensation and a plan showing the proposed transmission line or facility relative to the landowner's property. Additional information may also be given to each landowner explaining power line safety, easement acquisition procedures, and damage settlement. In addition to permanent easements necessary for the construction of the line, marshalling yard agreements may be obtained from certain landowners for temporary construction, access, or staging areas for temporary storage of poles, vehicles, or other related items. Landowners will be notified in the event site access for soil boring is required to determine soil suitability in areas where certain soil characteristics may require special transmission structure design.

If a negotiated agreement to an easement cannot be reached, the Applicants have the power of eminent domain to obtain the necessary easement by Minnesota Statutues Section 308A.201, subd. 13 (2011) and by Section 222.36. In eminent domain the landowner has the authority to have the compensation for the easement be determined by impartial commissioners through a court process that is initiated by the Applicants.

6.3.1 Transmission Line Easement Acquisition

The Applicants will acquire easement rights for the new 115 kV transmission line. The Applicants' representatives will be available to discuss easement issues with all property owners.

6.3.2 Substations

It is not anticipated that the Applicants need additional land to accommodate the modifications at the existing MP Little Falls Substation. Crow Wing Power is considering expansion of their CWP Little Falls Substation fence line and

purchasing additional land 50 feet south of the substation. Crow Wing Power will obtain any necessary local approvals required beyond this proposed Route Permit. During the substation modification phase, any nearby property owners will be advised of the construction schedules.

6.4 Tree Clearing and Staking

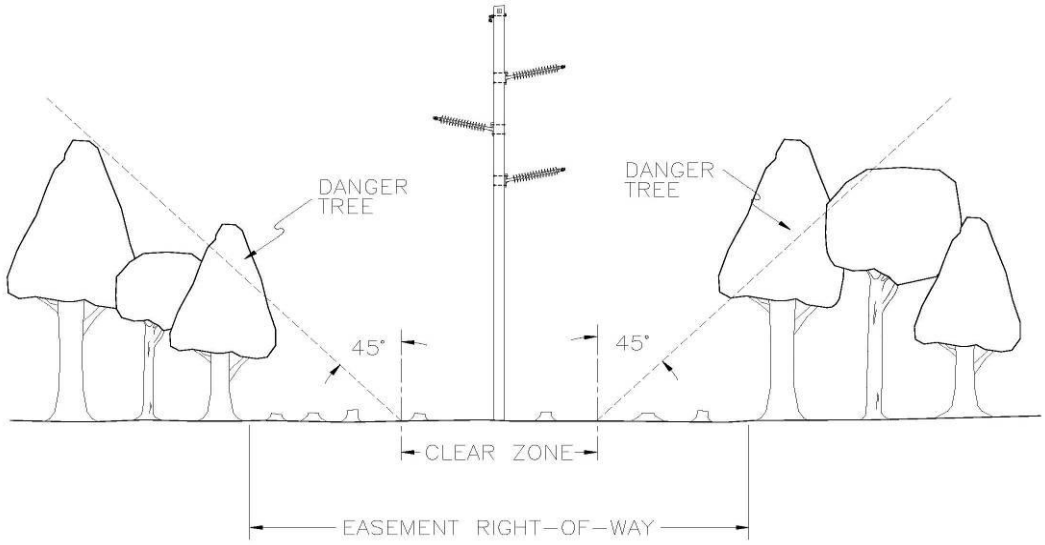
After land rights have been secured, landowners will be notified of the initial construction phase of the Project including schedules, ingress and egress to and from the planned facility, tree and vegetation removal, damage mitigation, and other related construction activities.

The first phase of construction activities will involve survey staking the centerline of the new transmission lines, followed by removal of trees and other vegetation from the rights of way. As a general practice, all vegetation is removed from the rights of way, unless it is negotiated with individual landowners that low-growing brush or tree species are allowed to remain on the outer limits of the easement area. All tall tree species that endanger the safe and reliable operation of the transmission facility must be removed from the rights of way.

The NESC states that “trees that may damage ungrounded supply conductors should be pruned or removed.” Trees beyond the easement area that are in danger of falling into the energized transmission line (“Danger Trees”) will be removed or trimmed to eliminate the hazard (as shown in Figure 6-1), as allowed by the terms in the existing easement or the new easement that is acquired. Danger trees generally are those that are dead, weak or the leaning towards the energized conductors. In special circumstances, tree trimming agreements may be possible to minimize tree removal based on negotiations with individual landowners.

The second phase of construction will involve staking the location of structures, followed by structure installation and stringing of conductor wire.

Figure 6-1 Standard Tree Removal Practices



6.5 Right of Way Restoration

Upon completion of construction activities, landowners will be contacted to determine whether or not construction damages have occurred. Areas that sustain construction damage will be restored to their pre-construction condition to the extent possible. Landowners will be notified of the completion of the Project, and asked to report any outstanding construction damage that has not been remedied or any other issue related to the construction of the transmission line. Once construction cleanup is complete and construction damages have been successfully mitigated, landowners will be sent a final contact letter signaling the close of the Project and requesting notification of any outstanding issues related to the Project.

7. CONSTRUCTION PRACTICES AND OPERATION AND MAINTENANCE OF THE HVTLS AND ASSOCIATED SUBSTATIONS

7.1 Construction Practices

7.1.1 Transmission Lines

The proposed 115 kV transmission lines would be constructed at existing grade elevations. Therefore, no pole locations would require grading, unless it is necessary to provide a level area for construction access and activities.

The Applicants design and construct transmission lines using the most cost-effective methods based on past experiences and practices and in compliance with the latest industry standards, as well as environmental and other permit conditions. The Applicants adhere to NESC standards regarding clearances to ground, clearance to crossing utilities, clearance to buildings, right of way widths, erecting power poles, and stringing of transmission line conductors.

The Applicants typically utilize outside contractors for construction activities on large transmission line projects. The specifications used are developed by the Applicants' Engineering and Project Management Department. A copy of the Applicants' easement restriction list, environmental restriction lists, the HVTL permit, and any required state or local permits are given to the awarded contractor prior to construction.

Typical tangent structures will be wood; however, laminated wood, or steel direct-embedded poles may need to be used in special circumstances where the typical wood poles may not provide the enough support. The structures will require a hole dug 10 to 15 feet deep with a 3 to 4 feet diameter for each pole. Any excess soil will be thin spread or removed from the site as required. The poles may be backfilled with native soils, crushed rock or concrete depending on design conditions. In lowland areas, a galvanized steel culvert may be also inserted for pole stability due to poor soil capacity.

Angle structures will typically be guyed. In some instances, an angle structure may consist of a self-supporting steel pole that will require a drilled pier concrete foundation. The pier will typically have a diameter of 4 to 8 feet. The hole may require a typical depth of 15 to 30 feet deep depending on design requirements. The pier will be filled with concrete delivered to the site via concrete trucks from a local batch plant.

Poles may be delivered to the staked location or to a designated marshalling yard depending on delivery and contractor availability. If the poles are delivered to a staked site, they are placed on the right of way out of the clear zone of any adjacent highways or designed pathways. The poles are typically framed with

insulators and hardware on the ground and then lifted and placed in the hole via a bucket truck or a crane, depending on the weight of the structure.

Once the structures have been erected, conductors are installed by establishing stringing setup areas within the right of way. These stringing setup areas are typically located every two miles along the Project route. The conductors are pulled with a rope lead that connects to every structure through a dolly attached at the insulator location. Temporary guard or clearance poles are installed at crossings to provide adequate clearance over other utilities, streets, roads, highways, railroads, or other obstructions after any necessary notifications are made or permit requirements met to mitigate any concerns with traffic flow or operations of other utilities.

In lowland areas, construction activities may occur during the winter season to mitigate any damage to wetland areas or other sensitive areas, or to comply with required crossing permits. Any special requirements for the contractor will be addressed at a preconstruction meeting prior to the start of any construction activities.

During construction, when temporary removal or relocation of fences may occur, installation of temporary or permanent gates may be required. The Applicants' right of way agents will coordinate with the landowners on replacement of fences and gates. As part of easement restriction lists, the contractor will work around cultivated areas until harvest has occurred.

7.1.2 Substation Modifications

Modification of both Little Falls substations will begin once permits are received and the final designs are complete. A detailed construction schedule will be developed based upon availability of crews, outage restrictions for any transmission lines that may be affected, weather conditions, spring load restrictions on roads, and any restrictions placed on certain areas for minimizing impacts from construction. The MP Little Substation will have a new bay added and will not require any additional grading. The CWP Substation will require grading to accommodate the proposed south 50 foot expansion. New footings for the high side and a new slab for the transformer will be added.

All modifications will be completed in accordance with state, NESC, and the Applicants' construction standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, right of way widths, erection of power poles (to connect the line to the substation), and stringing of transmission line conductors.

If it is determined that over an acre of soil will be disturbed, Minnesota Power and Crow Wing Power will obtain a National Pollutant Discharge Elimination System (NPDES) construction stormwater permit from the MPCA and will prepare the

required Stormwater Pollution Prevention Plan (SWPPP). Erosion control methods will be utilized to minimize runoff during substation modification activities.

Upon completion of construction activities, the Applicants and Crow Wing Power will restore the sites. Post-construction reclamation activities include the removing and disposing of debris, dismantling all temporary facilities (including staging areas), employing appropriate erosion control measures, and reseeding areas disturbed by construction activities with vegetation similar to that which was removed.

Crow Wing Power and/or the Applicants will perform periodic inspections, maintain equipment, and make repairs over the life of the substations. Minnesota Power and Crow Wing Power will also conduct routine maintenance as required to remove undesired vegetation that may interfere with the safe and reliable operation of the substations.

7.2 Operation and Maintenance

The Applicants will periodically use their transmission line rights of way to perform inspections, maintain equipment, and repair damage. Regular maintenance and inspections will be performed over the life of the facilities to ensure a reliable system. Annual inspections will be done by foot, snowmobile, All-Terrain Vehicles, pickup truck, or by aerial means. These inspections will be limited to the acquired right of way and areas where obstructions or terrain require access off the easement. An aerial inspection of each transmission line is conducted monthly to ensure reliable operation.

The Applicants will conduct vegetation surveys and remove undesired vegetation that will interfere with the operation of their transmission lines. Frequency of vegetation maintenance is on a three to seven year cycle. Right of way clearing practices include a combination of mechanical and hand clearing, along with an application of herbicides where allowed.

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8. ENVIRONMENTAL INFORMATION – PROPOSED PROJECT

This portion of the Application provides a description of the land use and environmental resources in the Project area and potential impacts and proposed mitigative measures of this Project.

The Project has been reviewed by a number of state and federal agencies. All environmental review correspondence related to the proposed 115 kV Project is provided in Appendix A.

8.1 Description of Environmental Setting

The Applicants are proposing to construct a 115 kV transmission line connecting the MP Little Falls Substation to the CWP Little Falls Substation and a second 115 kV transmission line of approximately 0.51 miles between the MP Little Falls Substation and the 46 line. The total length of the proposed 115 kV transmission lines is approximately 4.35 miles, located in Little Falls Township in Morrison County, Minnesota, as shown in Figure B-5 (Appendix B).

The Project area is dominated by agricultural land with small pockets of forest and wetlands. Some residential areas exist along the road rights of way and are scattered within the area. The residential areas within the Project area are primarily single-family homes of varying density. Open space areas include cultivated lands with small pockets of forest, wetlands and grasslands.

The environmental setting within the Project area includes three hydrologic features in Little Falls Township. These hydrologic features are a wetland located in Section 13, the Platte River located in Section 19 and the Rice Creek located in Section 17. A mix of groundcover is present along the Proposed Route. The physiographic features (topography, soils, geology and farmland) are typical of this area and do not preclude the development of this Project.

Blanding's turtles, sandhill cranes, whooping cranes and migratory waterfowl are found in the vicinity of the Project area.

8.2 Effects on Human Settlement

8.2.1 Public Health and Safety

There are different types of health and safety issues that could arise from a transmission project, including changes in traffic during construction, construction worker safety and change in flight patterns for a neighboring airport. A discussion of EMF is provided in Section 5.3.

Proper safeguards would be implemented for construction and operation of the transmission facilities. The Project will be designed in compliance with local, state, NESC and the Applicants' standards regarding clearance to the ground,

clearance to crossing utilities, strength of materials and right of way widths. Construction crews and/or contract crews would comply with local, state and NESC standards regarding installation of facilities and standard construction practices. The Applicants' established safety procedures as well as industry safety procedures would be followed during and after installation of the transmission line and substation modifications, including clear signage during all construction activities.

The Minnesota Department of Transportation (MnDOT), Office of Aeronautics was contacted[25] requesting information on the possible effects of the proposed Project on airports or airstrips in the Project area. In a letter[26] dated December 9, 2010 (Appendix A), the MnDOT indicated that "they do not anticipate any effect on the operation of publicly-owned airports; therefore the Office of Aeronautics has no objection to the proposed project."

Impacts and Mitigation

Protective devices will be used to safeguard the public if an accident occurs and a structure or conductor falls to the ground. The Little Falls substations are already equipped with breakers and relays located where existing transmission lines connect to the substations. The protective equipment is designed to de-energize the transmission line should such an event occur.

The Applicants will ensure that safety requirements are met during the construction and operation of the facility per Applicants' standards and local, state and federal requirements. Additionally, when crossing roads during stringing operations, traffic safety signage and flaggers, as required and necessary, will be utilized to eliminate traffic delays and provide safeguards for the public. With implementation of these safeguards and protective measures, no additional mitigation is proposed.

During construction of the transmission line, Great River Energy will flag with warning signs of construction activity along the roadway per required MnDOT or County standards per permits. Great River Energy's crews or contractors will comply with all Occupational Safety and Health Administration (OSHA) safety procedures during construction.

There are no anticipated impacts to airports in the area, therefore no mitigation is proposed. A discussion of EMF impacts and mitigation is provided in Section 5.3.3.

[25] Letter from Marsha Parlow, Great River Energy to Gene Scott, MNDOT. 7 December 2010. *See* Appendix A.
[26] Letter from Gene R. Scott, MNDOT to Marsha Parlow, Great River Energy. 9 December 2010. *See* Appendix A.

8.2.2 Displacement

The transmission lines will be designed to avoid displacement of existing residences or farms. Displacement would be avoided by placing the transmission lines away from the buildings.

8.2.3 Noise

There are three potential sources of audible noise from the Project; the conductors on the transmission lines and the two Little Falls Substations. The Project is located in agricultural areas near low volume roads and will be some distance from most residences in the area.

Noise Measurement

Noise levels are measured on a logarithmic scale in units of decibels. The A weighted decibel (dBA) scale corresponds to the sensitivity range for human hearing. For example, a noise level change of 3 dBA is barely perceptible to average human hearing while a 5 dBA change in noise level is noticeable. A 10 dBA change in noise level is perceived as a doubling of noise loudness. Estimates of some common noise sources are presented in Table 8-1.[27]

Table 8-1 Common Noise Levels

Sound Level dBA	Noise Source
140	Jet Engine (at 25 meters)
130	Jet Aircraft (at 100 meters)
120	Rock and Roll Concert
110	Pneumatic Chipper
100	Jointer/Planer
90	Chainsaw
80	Heavy Truck Traffic
70	Business Office
60	Conversational Speech
50	Library
40	Bedroom
30	Secluded Woods
20	Whisper

Noise Regulations

Land use activities associated with residential, commercial, and industrial land are grouped together into Noise Area Classifications (NAC).[28] Residences, which are typically considered sensitive to noise, are classified as NAC 1. Each NAC is assigned both daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) limits

[27] *A Guide to Noise control in Minnesota*, Minnesota Pollution Control Agency (1999). http://www.pca.state.mn.us/waste/pubs/noise.pdf

[28] Minn. R. 7030.0050.

for land use activities within the NAC.[29] Table 8-2 shows the MPCA daytime and nighttime limits in dBA for each NAC. The limits are expressed as a range of permissible dBA within a 1-hour period; L50 is the dBA that may be exceeded up to 50 percent of the time within an hour, while L10 is the dBA that may be exceeded up to 10 percent of the time within 1 hour.

Table 8-2 Noise Area Classifications[30]

	Day (0700-2200)		Night (2200-0700)	
NAC	L_{50}	L_{10}	L_{50}	L_{10}
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

Typical noise sensitive receptors along the route will include residences, churches, and schools; however, most of the land use along the route is rural timber, wetland or agricultural land. Current average noise levels in these areas are typically in the 30 to 40 dBA range and are considered acceptable for residential land use activities. Ambient noise in rural areas is commonly made up of rustling vegetation and infrequent vehicle pass-bys. Higher ambient noise levels, typically 50 to 60 dBA, will be expected near roadways, urban areas and commercial and industrial properties in the Project area.

Conductor Noise

Audible noise from electrical conductors is due to point source corona (minor breakdown of air insulating a conductor) and is a function of conductor voltage gradient. The maximum noise emission from a transmission line occurs during heavy rain and wet conductor conditions. In foggy, damp, or rainy weather conditions, power lines can create a crackling sound due to the small amount of electricity ionizing the moist air near the wires. During heavy rain, the general background noise level is usually greater than the noise from the transmission line. However, very few people are out near the line at these times. As a result, people do not normally notice audible noise from a transmission line during heavy rain. Transmission lines will typically produce audible noise at household background levels during light rain, dense fog, snow and other times when there is moisture in the air. During dry weather, audible noise from transmission lines is barely perceptible.

The industry standard for utilities is calculated based on L_{50} and L_5 for audible noise emissions. The L_5 is the noise level exceeded five percent of the time, or for three minutes in an hour. The worst-case scenario is when the transmission line is exposed to heavy rain conditions (one inch per hour). Anticipated levels for heavy rain conditions for 115 kV lines based on the results from the Bonneville Power Administration Corona and Field Effects Program version 3

[29] Minn. R. 7030.0040.
[30] Minn. R. 7030.0040.

(U.S. Department of Energy, Bonneville Power Administration (BPA), Undated) are listed in Table 8-3.

Table 8-3 BPA Program Results – Heavy Rain Case

L_5	L_{50}	Location
17.7 dBA	14.2 dBA	1 (edge of right of way)
18.8 dBA	15.3 dBA	3 (directly under the line)

BPA has developed a general guideline based upon public response to alternating current (AC) transmission line audible noise. The guideline indicates that numerous complaints can be expected if the line noise exceeds approximately 58.5 dBA and that few complaints should be expected if audible noise is limited to 52.5 dBA. The values for the proposed Project are well below the guidelines mentioned above and audible noise will be barely perceptible during fair weather.

Substation Noise

The proposed substation modifications will be designed and constructed to comply with the state noise standards (Minnesota Rules 7030) described above.

Noise associated with substations includes the operation of transformers and switchgear. The transformers produce a constant low-frequency humming noise while the switchgear produces an impulsive or short duration noise during infrequent activation of the circuit breakers. Due to the infrequent operation of the switchgear, the noise generated would be considered temporary in nature and not predicted to exceed the MPCA Noise Limits.

Because no new transformers will be installed at the MP Little Falls Substation, there will be no change in area noise levels due to this Project at this MP substation.

Noise levels for a typical type of transformer to be installed for this Project at the CWP Little Falls Substation (measured one meter from the equipment) are 66 dBA when the transformer cooling fans are not running and 70 dBA when the fans are running. To conservatively predict future noise levels and compliance with the 50-dBA limit, the 70-dBA noise level was treated as a point source at the transformer and modeled to determine the distance where the noise levels would be reduced to 50 dBA.

A simplified, conservative model[31] was created to determine the distance at which the noise would attenuate to 50 dBA. Noise propagation through the

[31] The simplified model is based off the following formula: S2 = S1 – (20 * Log(d2/d1)). S2 = Noise level at distance d2 (dBA), S1 = Measured sound level at d1 (dBA), D1 = Distance from noise source to S1 noise measurement (ft), and D2 = Distance from noise source at which S2 is calculated (ft).

outdoor atmosphere typically decreases in level with increasing distance between the source and the receiver. The noise attenuation is the result of several mechanisms, including geometrical spreading of the sound waves, shielding provided by physical structures, atmospheric absorption of the acoustic energy and ground effects on the sound waves. In general, the noise or sound pressure levels emitted from the substations will decrease approximately 6 dBA for each doubling of distance from the source to the receiver. The simplified model was prepared based on this 6-dBA reduction with a doubling of distance. The model is conservative in that it does not factor in geometric spreading or any attenuation from shielding or ground effects.

Based on the model, substation noise level at the CWP Little Falls Substation would attenuate to 50 dBA at a distance of approximately 30 feet from the transformer. The nearest residence is approximately 1,485 feet from the CWP Little Falls Substation and at this distance, the noise level would be approximately 16 dBA.

Impacts and Mitigation

By siting the Project away from homes to the extent possible, the Applicants have minimized the potential for noise impacts to sensitive receptors. The calculated noise values for the proposed Project are well below the Minnesota regulatory limits. No impacts are anticipated; therefore, no additional mitigation is proposed. There is a potential for additional noise during construction of the Project but will only be temporary and during daylight hours. The Applicants will work with neighboring residences if there are any concerns on noise during construction.

8.2.4 Radio/TV Interference

Under certain conditions, the localized electric fields near an energized transmission line conductor can produce small electric discharges, ionizing nearby air. This is commonly referred to as the “corona” effect. Most often, corona formation is related to some sort of irregularities on the conductor, such as scratches or nicks, dust buildup, or water droplets. The air ionization caused by corona discharges can result in the formation of audible noise and radio frequency (RF) noise. If the discharges are excessive, the audible noise can reach annoyance levels and the RF discharges can cause interference with radio and television reception. The potential for radio and television signal interference, however, is largely dependent on the magnitude of the corona-induced RF noise *relative to* the strength of the broadcast signals.

Corona formation is a function of the conductor radius, surface condition, line geometry, weather condition, and most importantly, the line’s operating voltage. Corona-induced audible noise and radio and television interference are typically

not a concern for power lines with operating voltages below 161 kV, because the electric field intensity is too low to produce significant corona. The expected electric field intensity due to the Project's transmission lines is provided in Section 5.3.1.

Because the likelihood of significant corona formation on the Project's 115 kV lines is minimal, the likelihood of radio and television interference due to corona discharges associated with the Project's transmission lines is also minimal. The Applicants are unaware of any complaints related to radio or television interference resulting from the operation of existing 115 kV facilities in the Project area and do not expect radio and television interference to be an issue along the Proposed Route.

If radio interference from transmission line corona does occur with AM radio stations presently providing good reception, satisfactory reception can be obtained by appropriate modification of (or addition to) the receiving antenna system.

Interference with FM broadcast station reception is generally not a problem because:

- corona-generated RF noise currents decrease in magnitude with increasing frequency and are quite small in the FM broadcast band (88-108 megahertz), and

- excellent interference rejection properties inherent in FM radio systems make them virtually immune to amplitude type disturbances.

A two-way mobile radio located immediately adjacent to and behind a large metallic structure (such as a steel tower) may experience interference because of signal blocking effects. Movement of either mobile unit so that the metallic structure is not immediately between the two units should restore communications. This would generally require a movement of less than 50 feet by the mobile unit adjacent to a metallic tower. Noise in the frequency range of cellular type phones is almost nonexistent and the technology used by these devices is superior to that used in two-way mobile radio.

Digital and satellite television are expected to have very little interference with corona noise. Compared to previously used analog broadcasts, digital is more immune to electric interference but less tolerant to multipath issues (i.e. reflections from structures/conductors). TV picture reception interference can also be the result of a transmission structure blocking the signal to homes in close proximity to a structure. Because the structures proposed for this Project will primarily be wood, this is unlikely to occur. However, measurements can be made to verify whether a structure or conductors are the cause of reception problems. Reception problems for digital television can usually be corrected with

the addition of an outside antenna. Moving the consumer's satellite dish will usually restore television reception.

Loose and/or damaged hardware may also cause television interference. If television or radio interference is caused by or from the operation of the proposed 115 kV lines within a broadcast station's primary coverage area where good reception is presently obtained, the Applicants will inspect and repair any loose or damaged hardware in the transmission line, or take other necessary action to restore reception to the present level.

8.2.5 Aesthetics

The area is primarily agricultural with scattered rural homesteads. The electrical system in the area includes a few 115 kV lines with H-frame structures at 50 to 70 feet in height. Most of the electrical system in the area consists of smaller 34.5 kV lines with both underground construction and overhead single pole construction at approximately 39 feet in height.

The Project will introduce transmission structures into the landscape. Most of the substation improvements for the MP Little Falls Substation will be within the fenced area. The CWP Little Falls Substation is proposed to expand approximately 50 feet to the south to accommodate the new high side and transformer.

Great River Energy proposes to construct the 115 kV single circuit line using primarily single pole wood structures with horizontal post insulators. In some areas, such as where a longer span may be required, braced post insulators or H-Frame design may be used. The average height will be between 60 and 85 feet, with an average span of 250 to 300 feet with distribution underbuild and 300 to 400 feet with no underbuild. The majority of the Project will be built with structures that have a narrow profile and that fit well next to roadways. Braced post or H-frame structures have a wider design, but are beneficial in situations where longer spans are desired.

Minnesota Power proposes to use H-Frame structures (Minnesota Power's standard construction) for the 0.51 mile route near the MP Little Falls Substation to connect to the existing 46 line. The existing 46 line is H-frame construction.

Of the 4.35 mile Proposed Route, 3.04 miles crosses or parallels local roads. None of these roadways are designated as Scenic Byways.

The Great River Energy transmission line will be visible along the roads that it parallels. In some areas it may replace an existing distribution line, which would be attached to the new poles. Homes within 500 feet of the Proposed Route alignment will be the most likely to have their viewshed affected by the construction of a transmission line, and are therefore considered potentially high visual sensitivity resources.

The residences and farms within varying distances of the road centerlines along the Proposed Route include one within 100 feet from the road centerline and one within 200 feet. The buildings were counted on both sides of the road (Figure B-14, Appendix B).

Mitigation

Although the new transmission lines will be a contrast to surrounding land uses, the Applicants will work with landowners to indentify concerns related to the proposed transmission lines and upgraded substations. Mitigation will be implemented to the extent possible, as follows:

- Location of structures, right of way and other disturbed areas will be determined by considering input from landowners or land management agencies to minimize visual impacts.

- Care will be used to preserve the natural landscape; construction and operation will be conducted to prevent any unnecessary destruction of the natural surroundings in the vicinity of the work.

- To the extent practicable, new transmission lines will parallel existing transmission lines and other rights of way, to the extent that such actions do not violate sound engineering principles or system reliability criteria.

- Structures will be placed at the maximum feasible distance from road, trail and water crossings, within limits of structure design.

- Landowners will be compensated for removal of mature yard trees, either through easement negotiations or on a separate basis.

8.2.6 Socioeconomics

Demographics

The population of Morrison County in 2010 was 33,198 (Table 8-4), with a 4.6% increase in population from 2000 through 2010. The number of persons per square mile (density) in 2000 was 28.2. The total number of housing units in 2007 was 16,256. The home ownership rate in 2000 was 82.19% and housing units in multi-unit structures 9.6%.

Table 8-4 Population Characteristics

Characteristic	Minnesota	Morrison County
Population 2000	4,919,479	31,715
Population 2010[32]	5,303,925	33,198
Percent Change 2000-2010	7.8	4.6
Percent White[33]	88.6	98.1
Percent Black/African American	4.7	0.4
Percent American Indian	1.3	0.4
Percent Asian/ Pacific Islander	3.8	Z
Percent Other race	--	--
Percent More than One Race	1.6	0.7
Percent Hispanic/Latino	4.3	0.9
Median Household Income[34]	$57,318	$45,660
Home Ownership Rate	74.6	81.9
Median Value of Owner Occupied Housing	$122,400	$82,800
Persons per household	2.52	2.64
Percentage Below Poverty Level Individuals	9.5	13.3

Z – Value greater than zero but less than 0.1%

The minority population includes individuals who are members of the following population groups: Black; American Indian or Alaska Native; Asian; Native Hawaiian or other Pacific Islander; or Hispanic or Latino.

Morrison County is generally less racially and ethnically diverse than the state of Minnesota as a whole. Neither racial nor ethnic minorities would be disproportionately affected by the Project.

The latest available median household income (2008) for Morrison County was $45,660 with 13.3% of people living below the poverty level.

[32] US Census Bureau, 2010 Website, http://2010.census.gov/2010census/data/
[33] US Census Bureau, 2010 Website, http://quickfacts.census.gov/qfd/states/27/27097.html
[34] US Census Bureau, 2010 Website, http://quickfacts.census.gov/qfd/states/27/27097.html

Construction Work Force Requirements

During construction, there will be minimal positive impacts to community services, hotels and restaurants to support the utility personnel and contractors. It is estimated that 15 to 20 workers will be employed during construction of the Project, which is expected to last less than a year.

It is not expected that additional permanent jobs would be created by this Project. Construction activities would provide seasonal influx of additional revenue into the communities during the construction phase, and materials may be purchased locally.

Impacts and Mitigation

Construction of the Project should result in short-term positive economic impacts in the form of increased spending for lodging, meals and other consumer goods and services. The Project is expected to last less than a year with a workforce usually with no more than twenty people employed. It is not anticipated that the Project will create new permanent jobs, but it will create temporary construction jobs that will provide one-time influx of income to the area.

Expenditures for equipment, energy, fuel, operating supplies and other products and services will benefit businesses in Morrison County. Indirect impacts may occur through the increased capability of the electric system to supply energy to commercial and industrial users, which will contribute to the economic growth of the region.

There will also be some long-term beneficial impacts from the new transmission lines, including an increase to the county's tax base resulting with incremental increase in revenue from utility property taxes The increase in tax revenue for the entire Project is estimated at approximately $55,796 in 2012. The availability of reliable power in the area will have a positive effect on local businesses and residents. No mitigation is proposed.

8.2.7 Cultural Values

Cultural values include those perceived community beliefs or attitudes in a given area that provide a framework for that community's unity. The communities in the vicinity of the Project (Little Falls Township) appear to have cultural values corresponding with the economic activities of the region (agriculture and tourism).

Located in central Minnesota at the junctions of Highways 10, 27, and 371, it was the "little falls" in the Mississippi River that attracted the attention of entrepreneurs, as it had the traders and explorers. Today, Little Falls is still

attracting businesses and travelers with its many historical sites, as well as scenic and recreational opportunities for nature and sport buffs.[35]

Impacts and Mitigation
No negative impacts to cultural values are anticipated; therefore, no mitigation is proposed.

8.2.8 Public Services

Public services provided in the Little Falls area (i.e., police, fire protection, waste collection, etc.) will not be affected by the proposed transmission Project.

Impacts and Mitigation
No negative impacts to public services in the community are anticipated; therefore, no mitigation is proposed.

8.2.9 Utilities

There are both Crow Wing Power overhead and underground distribution lines in project area. The proposed transmission line would cross Northern Natural gas pipelines. Viking gas pipelines are northeast of the project area.

Impacts and Mitigation
Portions of the existing Crow Wing Power overhead and underground distribution lines along the Proposed Route may be removed and placed on the same poles as the new Great River Energy transmission line. Where both underground and overhead distribution lines share the same right of way, there is a possibility those lines will be double circuited underneath the proposed transmission line.

Two parallel eight inch Northern Natural Gas pipelines in the Project area would be crossed twice by the proposed Great River Energy transmission line (see Figure B-5, Appendix B). Great River Energy will work with the pipeline owner and perform reasonable testing at Great River Energy's cost to identify any potential corrosion issues. Corrosion mitigation will be done if determined necessary as a result of the testing.

8.2.10 Transportation

There are township and county roads in the area. The proposed project will follow along 180th Avenue, County Road 256, 133rd Street and 195th Avenue. There are no railroads in the area.

Impacts and Mitigation
There will be temporary impact during construction of the transmission line. During construction temporary guard or clearance poles are installed at crossings

[35] http://www.littlefallsmn.com/Community.php

to provide adequate clearance over other utilities, streets, roads, highways, railroads, or other obstructions after any necessary notifications are made or permit requirements met to mitigate any concerns with traffic flow or operations of other utilities. Additionally, traffic safety signage and flaggers, as required and necessary, will be utilized to eliminate traffic delays and provide safeguards for the public. The Applicants will follow required MnDOT or County standards per permits. No permanent impacts to transportation are anticipated; therefore, no mitigation is proposed.

8.3 Effects on Land-Based Economies

8.3.1 Agriculture

There is cultivated agricultural land and a small percentage of pasture, hay and grassland along the Proposed Route (Figure B-15, Appendix B). Approximately five percent of the length of the Proposed Route is hay, pasture or grassland. Approximately 92 percent of the Proposed Route is cultivated agricultural land.[36]

Impacts and Mitigation

The Project will result in permanent and temporary impacts to cultivated agricultural land. Permanent impacts will occur as a result of structure placement along the route centerlines. The area of impact will be the footprint of the pole itself and the area immediately surrounding the pole (approximately 30 square feet), although the majority of the right of way easement that is generally 50 feet on each side of the transmission centerline or 60 feet on each side where H-frame or brace post insulators are used will be available for agricultural cultivation. It is estimated that approximately 1,890 square feet would be impacted in the Proposed Route.

During construction, temporary impacts, such as soil compaction and crop damage within the right of way are likely to occur. The majority of construction activity will occur in the easement area. If needed, a temporary storage area outside of the easement area for the storage of material and equipment may be leased for the duration of construction. The Applicants will work with landowners to minimize impacts to all farming operations along the route. By aligning the transmission lines parallel to existing transmission line, distribution line and road rights of ways, impacts can be minimized. The Applicants will compensate landowners for any crop damage and soil compaction that may occur during construction. Areas disturbed during construction will be repaired and restored to pre-construction contours as required so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural re-vegetation, provide for proper drainage and prevent erosion.

Specific mitigation measures to be implemented include:

[36] http://www.mngeo.state.mn.us/chouse/land_use.html

- The movement of crews and equipment will be limited to the right of way to the greatest extent possible, including access to routes. Contractors employed by the Applicants will limit movement on the right of way to minimize damage to grazing land, crops, or property. If movement outside of the right of way is necessary during construction, permission will be obtained and any crop damage will be paid to the landowner.

- When weather and ground conditions permit, deep ruts that are hazardous to farming operations will be repaired or compensation will be provided as an alternative if the landowner desires Such ruts will be leveled, filled and graded or otherwise eliminated in an approved manner. In hay meadows, alfalfa fields, pastures and cultivated productive lands, compacted soils will be loosened and ruts will be leveled by scarifying, harrowing, disking, or by other approved methods. Damage to ditches, tile drains, terraces, roads and other features of the land will generally be avoided by locating these features during survey or discussion with landowners and then avoiding them during construction. If damage does occur, it will be repaired or compensation will be provided as an alternate if the landowner desires. The property will be restored as nearly as practical to its original conditions.

- Right of way easements will be purchased through negotiations with each landowner affected by the Project. After construction and right of way restoration is complete, payment will be made for full value of crop damages or other remaining property damage that occurs during construction or maintenance.

- To the extent possible, construction will be scheduled during periods when agricultural activities will be minimally affected or the landowner will be compensated accordingly.

- Fences, gates and similar improvements that are removed or damaged will be promptly repaired or replaced.

Some temporary construction space will be needed for the Project. For temporary marshalling yards, which will provide space to store material and equipment, the Applicants will lease the space by agreement with the respective landowner(s), remove and properly dispose of all material and debris, and repair all damages and perform restoration, as necessary. It is not anticipated that temporary construction space outside of the right of way and on private property will be needed, with the exception of limited equipment access.

8.3.2 Forestry

In 1982, approximately 215,000 acres or 30% of Morrison County was forested, with 50,000 acres in the Camp Ripley Military Reserve. The rest was privately

owned.[37] Approximately 2.9 percent of the Proposed Route would cross forested land, or approximately 1.26 acres. This forested land is mostly windbreaks or small natural forested areas.

Impacts and Mitigation

The entire width of the transmission line right of way (50 feet on each side of the transmission centerline) would need to be cleared of vegetation that could potentially grow into the conductors. Based on a rough estimate from the Land Use Map (Figure B-15, Appendix B), the Proposed Route will affect 1.26 acres of forested land. This is only an estimate because it is not known on which side of the road the transmission line will be located.

The Applicants will replace or compensate for windbreaks as determined through negotiations with individual landowners.

8.3.3 Tourism

Tourism in the Little Falls area consists of golfing, fishing, camping, canoeing, hiking, biking, birding, cross-country skiing, snowmobiling, hunting, and shooting.[38] Attractions in the Little Falls area include: Charles A. Lindbergh State Park, Camp Ripley Environmental Center, Platt River Trail and the Soo Line Recreational Trail.[39]

Although there are no known tourism attractions within the Proposed Route, there are trails south of it. The Platte River Trail System is approximately one mile south of the Proposed Route. The Soo Line ATV trail is approximately three miles south of the Proposed Route.

Impacts and Mitigation

Tourism should be unaffected by the proposed Project because there are no known attractions within the Proposed Route. No mitigation is proposed.

8.3.4 Mineable Resources

Mineable resources should be unaffected by the proposed Project because there are no known mining resources in the vicinity of the Proposed Route. No mitigation is proposed.

[37] http://soildatamart.nrcs.usda.gov/manuscripts/MN097/0/Morrison_MN.pdf , Soil Survey of Morrison County, Minnesota, Page 66.
[38] http://www.littlefallsmn.com/images/Attractions_Brochure.pdf
[39] http://www.littlefallsmn.com/AreaAttractions.php

8.4 Cultural Resources

The Minnesota Historical Society (MHS) was contacted[40] to request information on the possible effects of the proposed Project on historic properties in the Project area. In a letter dated December 30, 2010 (Appendix A),[41] MHS indicated that the proposed Project was reviewed pursuant to the responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and the Procedures of the Advisory Council on Historic Preservation (36 Code of Federal Regulations 800). Westwood Professional Services was contracted to conduct a literature review of the Proposed Route.[42]

8.4.1 Archaeological and Historic Resources

MHS indicated that "there are no properties listed on the National or State Registers of Historical Places, and no known or suspected archaeological properties in the area that will be affected by this project." In a letter dated May 16th, 2011, Westwood Professional Services "concurs with the findings of the Minnesota SHPO (State Historical Preservation Office) summarized in their letter issued December 30, 2010, that no known or suspected archaeological properties will be affected by this project."[43]

Impacts and Mitigation

No known historical resources were identified within the Proposed Route or near the substation sites. Therefore, no impacts are anticipated during the installation of the transmission lines. If any archaeological sites are identified during placement of the poles along the permitted route, construction work will be stopped and MHS staff consulted as to how to proceed.

8.5 Natural Environment

8.5.1 Air Quality

Temporary air quality impacts caused by construction vehicle emissions and fugitive dust from right of way clearing and construction are expected to occur. The only potential air emissions from operation of a transmission line result from corona, which may produce ozone and oxides of nitrogen. This can occur when the electric field intensity exceeds the breakdown strength of the air. For a 115 kV transmission line, the conductor surface gradient is typically below the air

[40] Letter from Marsha Parlow, Great River Energy to Mary Ann Heidmann, MHS. 7 December 2010. *See* Appendix A.
[41] Letter from Britta L. Bloomberg, MHS to Marsha Parlow, Great River Energy. 30 December 2010. *See* Appendix A.
[42] Letter from Dean Sather, Westwood Professional Services to Marsha Parlow, Great River Energy, 16 May 2011. *See* Appendix A.
[43] Letter from Dean Sather, Westwood Professional Services to Marsha Parlow, Great River Energy, 16 May 2011. *See* Appendix A.

breakdown level. As such, it is unlikely that any measurable emissions would occur from the conductor surface.

Impacts and Mitigation

No impacts to air quality are anticipated due to the operation of the transmission line; therefore, no mitigation is proposed.

Exhaust emissions from diesel equipment will vary during construction, but will be minimal and temporary. The magnitude of emissions is influenced heavily by weather conditions and the specific construction activity taking place. Appropriate dust control measures will be implemented.

8.5.2 Water Resources

Hydrologic features in the Project area and along the Proposed Route are shown in Figure B-16 (Appendix B).

Ground Water

The Minnesota Department of Natural Resources (DNR) divides Minnesota into six groundwater provinces. This Project is in the portion of Morrison County that falls into the Central Province, which is described as sand aquifers in generally thick sandy and clayey glacial drift overlaying Precambrian and Cretaceous bedrock.[44]

Surface Water

The Project area lies within the Mississippi River (Sartell) watershed of the Upper Mississippi River Basin.[45]

The Project would require a United States Army Corps of Engineers (Corps) permit under Section 10 of the Rivers and Harbors Act if the work involves a navigable water of the United States.[46]

The Corps was contacted[47] requesting information on the possible effects of the proposed Project on floodplains, waters, and wetlands in the Project area and along the Proposed Route. The Corps typically only provides a general response on a project until it receives a jurisdictional determination request and/or a permit application. In a letter dated January 20, 2011 (Appendix A),[48] the Corps did address its regulatory jurisdiction and permitting requirements.

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[44] http://files.dnr.state.mn.us/natural_resources/water/groundwater/provinces/gwprov.pdf (2009)
[45] http://www.pca.state.mn.us/water/basins/uppermiss/index.html (2009)
[46] Letter from Marsha Parlow, Great River Energy, to Leo Garbowski, USACE. 7 December 2010. *See* Appendix A.
[47] Letter from Marsha Parlow, Great River Energy, to Leo Garbowski, USACE. 7 December 2010. *See* Appendix A.
[48] Letter from Leo Grabowski, USACE to Marsha Parlow, Great River Energy, 20 January 2011. *See* Appendix A.

Public Waters are wetlands, water basins and watercourses of significant recreational or natural resource value in Minnesota as defined in Minnesota Statutes Section 103G.005. The DNR has regulatory jurisdiction over these waters.

Based on review of the DNR website, there are no Public Waters, lakes, rivers, streams, ditches or riparian areas within the Proposed Route.[49] The MPCA website shows the Platte River is an impaired water near the Project.[50] The transmission lines and substation modifications would not affect any floodplains of the Platte River (Figure B-16, Appendix B).[51]

Wetlands

Wetlands are important resources for flood abatement, wildlife habitat, and water quality. Wetlands that are hydrologically connected to the nation's navigable rivers are protected federally under Section 404 of the Clean Water Act. In Minnesota, wetlands are also protected under the Wetland Conservation Act.

The United States Fish and Wildlife Service (USFWS) produced maps of wetlands based on aerial photographs and NRCS soil surveys starting in the 1970s. These wetlands are known as the National Wetland Inventory (NWI).[52] Wetlands listed on the NWI may be inconsistent with current wetland conditions; however, NWIs are the most accurate and readily available database of wetland resources within the Project area and were therefore used to identify wetlands along the Proposed Route. These maps show that there are wetlands in the Proposed Route (Sections 13 and 24). Great River Energy's transmission line would span these wetlands along 133rd Street.

The DNR Public Water Inventory (PWI) shows one wetland (219W in T40N R31W, Section 13) near the Proposed Route. However, the proposed transmission line would not cross this Public Water.

Impacts and Mitigation

The Proposed Route does not cross any lakes, and no navigable waters will be affected by the Project. The transmission line will not cross DNR Public Waters. The Project should have no impact on the impairment status of waters in the Project area.

Construction of the transmission lines is not expected to alter existing water drainage patterns or floodplain elevations due to the small cross section per structure and their relatively wide spacing.

[49] http://files.dnr.state.mn.us/waters/watermgmt_section/pwi/MORR2OF2.pdf
[50] http://www.pca.state.mn.us/index.php/water/water-types-and-programs/minnesotas-impaired-waters-and-tmdls/assessment-and-listing/maps-of-minnesotas-impaired-waters-and-tmdls.html?menuid=&redirect=1
[51] http://www.fema.gov/hazard/map/q3.shtm
[52] http://www.fws.gov/wetlands/Data/DataDownload.html

If there is potential to increase turbidity due to increase sedimentation from construction activities, appropriate erosion and sediment control measures will be implemented to avoid or minimize such impacts. Best Management Practices (BMPs) that are typically used include seeding, mulching, straw bales and/or silt fencing. Biologs would be used on steeper slopes.

Sound water and soil conservation practices will be maintained during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. These practices may include:

- Containment of stockpiled material away from stream banks and lake shorelines.
- Stockpiling and re-spreading topsoil.
- Reseeding and re-vegetating disturbed areas.
- Implementing erosion and sediment controls (BMPs).
- Structures and disturbed areas will be located as far away from wetlands as practicable.

Temporary impacts to wetlands may occur if they need to be crossed during construction of the transmission line. No staging or stringing set up areas will be placed within or adjacent to water resources, as practicable. Wetland impact avoidance measures that will be implemented during design and construction of the transmission line include spacing and placing the power poles at variable distances to span and avoid wetlands, where possible. When it is not possible to avoid a wetland, several measures will be utilized to minimize impacts during construction:

- When possible, construction will be scheduled during frozen ground conditions.
- Construction crews will attempt to access the wetland with the least amount of physical impact to the wetland (*i.e.,* shortest route) and will access poles near/in wetlands from roadways whenever possible to minimize travel through wetland areas.
- The structures will be assembled on upland areas before they are brought to the site for installation, when practicable.
- When construction during winter is not possible, construction mats (wooden mats or the Dura-Base Composite Mat System) will be used to protect wetland vegetation. Additionally, all-terrain construction vehicles may be used, which are designed to minimize soil impact in damp areas.

Once design details are available, if required, Great River Energy will apply for a Regional General Permit under Section 404 of the Clean Water Act from the Corps, restore the wetlands as required by the Corps, and comply with the requirements of the Wetland Conservation Act.

Once the Project is completed, there would be no significant impact on surface water quality because impacts to the soil will be minimized and mitigated, disturbed soil will be restored to previous conditions or better, and the amount of land area converted to an impervious surface will be small.

8.5.3 Natural Vegetation

The Project is located in the Northern Central Hardwoods Ecoregion, which is has undulating and rolling plain with drumlins and a mix of woodland, row crops and pasture.[53] Vegetative communities along the Proposed Route include cultivated fields, upland deciduous forests, shrubby grasslands, grasslands, and various types of wetlands.

Impacts and Mitigation

The DNR heritage database indicates that there is no native vegetation in the Proposed Route. Because the anticipated route avoids areas of native vegetation, no impacts to native vegetation are anticipated. No mitigation is proposed.

See Section 6.4 for impacts due to tree clearing along the transmission line right of way.

8.5.4 Wildlife/Rare and Unique Natural Resources

Wildlife

The USFWS website indicated that the gray wolf is present in Morrison County.[54] The USFWS was contacted by letter[55] and their response letter[56] dated January 7th, 2011 (Appendix A), indicated that "there are no federally listed or proposed species and/or designated or proposed critical habitat within the action area of the proposed project." The USFWS mentioned that the Project "does run along a half mile portion of the authorized acquisition boundary for Crane Meadows National Wildlife Refuge and is within a half mile of refuge owned lands." This refuge "is an important bird area for migratory waterfowl and sandhill cranes. The whooping crane is also an occasional visitor to the refuge during migration and is currently listed as a nonessential, experimental population and protected under certain provisions of the Endangered Species Act." The Whooping Crane and Sandhill Crane were not listed on the USFWS or the DNR websites as species of concern in the area.[57] However, the Applicants will follow any recommendations

[53] http://www.epa.gov/wed/pages/ecoregions/mn_eco.htm
[54] US Fish and Wildlife Webpage Endangered Species. http://www.fws.gov/Midwest/Endangered/LISTS/minnesot-cty.html
[55] Letter from Marsha Parlow, Great River Energy to Nick Rowse, US Fish and Wildlife Service. 7 December 2010. *See* Appendix A.
[56] Email from Andrew Horton, US Fish and Wildlife Service to Marsha Parlow, Great River Energy. 7 January 2011. *See* Appendix A.
[57] http://www.fws.gov/Midwest/Endangered/LISTS/minnesot-cty.html and http://www.dnr.state.mn.us/rsg/a-z_search.html

from the agencies. The USFWS has recommended bird diverters for particular sections of the transmission line.

Rare and Unique Features

Rare and unique natural features include federal and state protected and rare species, remnant areas of native vegetation, significant natural resource sites, and significant natural features.

The DNR was contacted[58] to request information on the possible effects of the proposed Project on rare and unique features in the Project area. Their response[59] email dated January 26, 2011, indicated that "Blanding's turtles (Emydoidea blandingii), a state-listed threatened species, have been reported from the vicinity of the proposed project and may be encountered on site." These occurrences are shown on Figure B-17 (Appendix B).

Impacts and Mitigation

There is a potential for the temporary displacement of wildlife and loss of habitat with the new transmission lines. Wildlife could be impacted within the immediate area of construction. The distance that animals will be displaced will depend on the species. Impacts to wildlife are anticipated to be short-term, as the transmission lines will be constructed parallel to existing rights of way. Additionally, these animals will be typical of those found in forested and agricultural settings, and will not incur population level effects due to construction. When possible, impacts to wooded areas along the Proposed Route will be avoided. Raptors, waterfowl, and other bird species may also be affected by the construction and placement of the transmission lines. Avian collisions are a possibility after the completion of the transmission lines and could potentially increase as a result of the proposed lines. Waterfowl are typically more susceptible to transmission line collision, especially if the line is placed between agricultural fields that serve as resting areas or along major migration flyways. The DNR indicated that this would be a concern on this Project. [60] Bird diverters will be installed per DNR and USFWS recommendations. [61] [62]

Additionally, large birds, such as raptors, are sometimes impacted by power lines through electrocution. This is generally an issue with distribution lines, as electrocution may occur when birds with large wingspans come in contact with either two conductors, or a conductor and grounding device. The Applicants' 115

[58] Letter from Marsha Parlow, Great River Energy to Lisa Joyal, Minnesota Department of Natural Resources. 7 December 2010. *See* Appendix A.
[59] Email from Lisa Joyal, Minnesota Department of Natural Resources to Marsha Parlow, Great River Energy. 26 January 2011. *See* Appendix A.
[60] Email from Beau Liddell, Department of Natural Resources to Michelle Lommel, Great River Energy. 29 November 2010. *See* Appendix A.
[61] Email from Beau Liddell, Department of Natural Resources to Michelle Lommel, Great River Energy. 29 November 2010. *See* Appendix A.
[62] Email from Andrew Horton, US Fish and Wildlife Service to Marsha Parlow, Great River Energy. 7 January 2011. *See* Appendix A.

kV transmission line designs for this Project will create greater separation between conductors and grounding devices to minimize electrocution hazards.

The Applicants will follow the recommendations by the DNR that "[i]f turtles are in imminent danger they should be moved by hand out of harm's way, otherwise they should be left undisturbed."[63]

8.6 Physiographic Features

8.6.1 Topography

The topography of Morrison County is the result of glacial deposition. The area is characterized by nearly level to moderate topography. The elevation ranges from approximately 1,117 to 1,220 feet above mean sea level.[64]

Impacts and Mitigation
The Project will not require grading along the right of way and excavation activities will be limited to pole locations. Construction of the Project will not alter the topography along the Proposed Route; however, minimal grading maybe required at the CWP Little Falls Substation. No mitigation is proposed.

8.6.2 Geology

The Mille Lacs Uplands Subsection consists primarily of Superior lobe ground moraine, and includes the Brainerd-Pierz and Automba Drumlin Fields. The depressions between drumlin ridges contain peatlands with shallow organic material. Glacial drift ranges from 100 to 300 feet in depth over bedrock. Bedrock consists of Middle to Late Archean and Early Proterozoic gneiss, amphibolite, undifferentiated granite, and metamorphosed mafic.[65] Brown and red till forms the parent material.[66]

Impacts and Mitigation
Construction of the Project will not alter the geology along the Proposed Route; therefore, no mitigation is proposed.

8.6.3 Soils

This region is made up of excessively drained soils on landforms that include end moraines, outwash plains, till plains, and drumlin field topography. Soils in the Project area (Figure B-18, Appendix B) tend to be sandy loams or loamy sands.[67]
Impacts and Mitigation

[63] Email from Lisa Joyal, Minnesota Department of Natural Resources to Marsha Parlow, Great River Energy. 26 January 2011. *See* Appendix A.
[64] http://www.dnr.state.mn.us/maps/tomo.html?mode=recenter&size=7&layer=24k&col=223&row=539
[65] http://www.dnr.state.mn.us/ecs/212Kb/index.html
[66] http://www.dnr.state.mn.us/ecs/212Kb/index.html
[67] http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Potential impacts of construction are compaction of the soil and exposing the soils to wind and water erosion. Impacts to physiographic features should be minimal during and after installation of the transmission line structures and these impacts will be short term. There should be no long-term impacts resulting from this Project.

Soils will be re-vegetated as soon as possible to minimize erosion or some other method used during construction to prevent soil erosion. Re-vegetation is usually accomplished by seeding native species indicative to the area. Mulch will be used in areas that need immediate cover.

If over an acre of soil will be disturbed during the construction of the Project, the Applicants and Crow Wing Power will obtain a NPDES construction stormwater permit from the MPCA and will prepare a SWPPP. Erosion control methods and BMPs will be utilized to minimize runoff during construction.

8.7 Land Use

Land use along the Proposed Route consists mainly of agricultural-related uses along with forest, grassland, pastureland, undeveloped land and rural residential uses (Figure B-15, Appendix B). Cultivated land and forested land are discussed in Sections 8.3.1 and 8.3.2, respectively. Water resources are discussed in Section 8.5.2.

Impacts and Mitigation

Impacts to land use will be limited to the area of the footprint of the poles and areas accessed by heavy construction equipment. After construction of the Project is complete, disturbed soils will be stabilized with native vegetation as soon as possible and land use will be minimally impacted.

8.7.1 Public Lands and Recreational Areas

There are no regional parks, recreational areas or State Wildlife Management Areas (WMA) within the Proposed Route. There are two WMAs close to the Project: the Popple Lake WMA approximately 0.2 mile feet west of the MP Little Falls Substation, and the Rice-Skunk WMA approximately 0.5 mile south of the intersection of 195th Avenue and 133rd Street. The Crane Meadows National Wildlife Refuge is 0.75 mile from the intersection of 195th Avenue and 133rd Street.

Impacts and Mitigation

No known direct impacts to recreational land uses are anticipated; therefore no mitigation is proposed. Temporary impacts may occur during construction and are discussed in Section 8.2. Potential indirect impacts to birds in the area are discussed in Section 8.5.4.

8.7.2 Zoning

A zoning map of the Project area is provided in Figure B-19 (Appendix B). The Proposed Route crosses areas designated Agricultural.[68] A Route Permit issued by the Commission supersedes any local zoning, building and land use regulations.[69] Crow Wing Power will obtain any necessary local approval required beyond this proposed Route Permit for the CWP Little Falls Substation.

Impacts and Mitigation

Potential land use impacts along the Proposed Route due to the 115 kV transmission lines will be limited. The Proposed Route for the 115 kV transmission lines will be approximately 4.35 miles long and will overtake existing transmission and distribution line right of way and parallel road right of way as much as possible. The new 115 kV transmission lines do not represent an incompatible land use with those that exist in the area. Therefore, anticipated impacts of the proposed Project on land use/zoning are minimal and no mitigation measures are proposed.

[68] Zoning information obtained from offices of Morrison County, Little Falls Township.
[69] Minn. Stat. §216E.10, subdiv. 1.

9. AGENCY INVOLVEMENT, PUBLIC PARTICIPATION, PERMITS AND APPROVALS REQUIRED

9.1 Agency Contacts/Public Participation

The Applicants contacted the following agencies for input on the proposed Project:

Minnesota Department of Transportation – Office of Aeronautics

Minnesota Department of Transportation – Transportation Department (Highway Issues)

Minnesota Historical Society – State Historic Preservation Office

US Army Corps of Engineers

Minnesota Department of Natural Resources

United States Fish and Wildlife Service

Correspondence to and from these agencies is provided in Appendix A.

The Applicants attended township board meetings in the Project area to describe the proposed Project to township board members. All of the township boards understand the need for additional electrical capacity in the Little Falls area. The Applicants also held a public information open house on December 6, 2010, to solicit public input on the Project. Approximately five people from the public attended the open house. The main issue discussed at the open house was how the Project affects farming activities.

9.2 Identification of Landowners

The names of each owner whose property is within the Proposed Route (Minnesota Rules 7850.1900, subp. 2G) are provided in Appendix C.

9.3 Required Permits and Approvals

A list of permits and other approvals that may be required for the Project in addition to a Minnesota Route Permit is presented in Table 9-1.

Table 9-1 Potential Permits Required

Permit	Jurisdiction
Federal Approvals	
Section 404 Permit, Clean Water Act (Local/State/Federal Application for Water/Wetland Projects, for discharge of fill due to placement of poles in wetlands) Section 106 Review	Corps of Engineers
Part 7460 review (to ensure compliance with 7460)	Federal Aviation Administration (FAA)
Spill Prevention, Control and Countermeasure (SPCC) Plan (Crow Wing Power, for CWP Little Falls Substation) (Minnesota Power, for MP Little Falls Substation)	EPA
Minnesota State Approvals	
License to Cross Public Waters or State Lands	DNR – Lands and Minerals
Utility Permit (Road Crossing Permits to cross or occupy state trunk highway road right of way)	MnDOT
NPDES Permit (Crow Wing Power, for modifications at CWP Little Falls Substation) (Minnesota Power, for modifications at MP Little Falls Substation) **NPDES Permit** (The Applicants, for line construction)	MPCA
Section 401, Clean Water Act	MPCA
Local Approvals	
Land Permits, including road crossing/right of way permits (may be required to occupy lands such as parklands, watershed districts, and other publicly-owned land)	County, Township
Minnesota Wetland Conservation Act Exemption	County
Road Crossing Permits	County, Township
Overwidth Loads Permits	County, Township
Driveway/Access Permits	County, Township
Conditional Use Permit for CWP Little Falls Substation (Crow Wing Power's Responsibility)	County

10. SUMMARY OF FACTORS TO BE CONSIDERED IN EVALUATING THIS APPLICATION

The Applicants have applied for a Route Permit for a 115 kV HVTL Project. The Project will allow both the Applicants and Crow Wing Power to maintain necessary voltage and reliability requirements in the Little Falls area. The Project endpoints are the existing MP Little Falls Substation on the west and the existing CWP Little Falls Substation on the east.

The role of the Commission is to determine the best route to follow to accomplish these goals, and to determine what mitigation efforts the Applicants should employ to reduce any human settlement or environmental consequences. Minn. Rules 7850.4100 lists 14 factors to consider in determining whether to issue a permit for the Proposed Route. Those factors are discussed briefly below.

A. Effects on human settlement, including but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services.

Effects of the proposed Project on human settlement are discussed in Section 8.2 of this Application. The Project will not result in displacement of existing residences. The noise from the HVTLs and modified substations will be minimal (Section 8.2.3).

The majority of the Proposed Route is along existing transmission and distribution lines and roadway corridors and will have minimal aesthetic effects. The proposed HVTLs and modified substations will have no impact on cultural values, recreation, or public services. Impacts to socioeconomics would be primarily of a short-term, beneficial nature.

Portions of the existing Crow Wing Power overhead and underground distribution lines along the Proposed Route may be removed and placed on the same poles as the new Great River Energy transmission line. Where both underground and overhead distribution lines share the same right of way, there is a possibility those lines will be double circuited underneath the proposed transmission line. Along roads, the transmission line centerline will be approximately two to five feet outside of the road right of way.

B. Effects on public health and safety.

The proposed Project will be constructed to comply with NESC standards. Questions often arise about electric and magnetic fields (EMF), which are invisible lines of force that surround any electrical device. The term EMF refers to electric and magnetic fields and includes natural sources such as earth's magnetic field or fields produced during thunder storms, as well as manmade fields produced by electric transmission lines, radio/TV stations, etc. The electric

and magnetic fields associated with the proposed Project are discussed in Section 5.3 of this Application and summarized in Tables 5-1 and 5-2.

Electric field intensity is proportional to the voltage of the line and is measured in kV/m. Electrical fields are blocked by physical barriers, such as trees, buildings, etc.

The proposed 115 kV transmission lines will have a maximum electric field density magnitude of approximately 1.30 kV/m underneath the conductors at one meter above ground level, which is well below the EQB standard of a maximum electric field limit of 8 kV/m at one meter above ground. That standard was implemented to mitigate serious hazard from shocks when touching large objects parked under transmission lines with voltage of 500 kV or greater.

Magnetic fields result from the flow of electricity (current) in the transmission line. Recent studies of the health effects from power frequency fields conclude that the evidence of health risk related to magnetic fields is weak. Currently the maximum flow will be limited to the size of the transformers at the Little Falls substations.

Because the magnetic field strength is dependent on current flow, it will continually change as electric demand increases or decreases. Typically the magnetic field will increase over time because the current flowing on the line increases as load growth occurs. The maximum magnetic field for the Project as proposed will be limited by the conductors.

C. Effects on land-based economies, including but not limited to, agricultural, forestry, tourism, and mining.

The Proposed Route for the HVTL does not significantly impact any prime agricultural, forestry or mining property. Impacts on tourism should be minimal (Section 8.3).

D. Effects on archaeological and historic resources.

MHS indicated that “there are no properties listed on the National or State Registers of Historical Places, and no known or suspected archaeological properties in the area that will be affected by this project” (Section 8.4). Westwood Professional Services concurred with the MHS findings.

E. Effects on the natural environment, including effects on air and water quality resources and flora and fauna.

Effects of the proposed Project on the natural environment are discussed in Sections 8.5 to 8.7 of this Application.

No significant impacts to air quality will result from the proposed Project.

Short-term impacts to water quality resources could occur due to soil disturbance during construction. The Applicants will implement BMPs such as silt fences to prevent sediment from entering surface waters.

Impacts to native, undisturbed flora will be avoided and/or minimized. Only trees and shrubs that would interfere with the safe operation of the line will be removed.

There is minimal potential for the displacement of fauna and loss of habitat from construction of the Project. Wildlife that inhabits natural areas could be impacted in the short-term within the immediate area of construction. This impact will be temporary because there is similar habitat adjacent to the sites.

F. Effects on rare and unique natural resources.

The DNR indicated that Blanding's turtles occur in the Project area. The USFWS determined that the whooping cranes, sandhill cranes and other migratory waterfowl are present in the Project area. Because the Proposed Route will utilize existing electric system alignments and parallel existing roads, impacts to habitat will be minimized. The Applicants will adhere to DNR and USFWS recommendations to minimize impacts (Section 8.5.4; Appendix B).

G. Application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission capacity.

There are no known or likely plans to add additional transmission capacity along the Proposed Route. Therefore, the design is appropriate to this Project and maximizes energy efficiency.

The Applicants will work with affected landowners to use a design that mitigates the impact on their property and the right of way to the extent possible.

Both of the Little Falls substations will be laid out to accommodate required equipment such as transmission line terminations, capacitor banks, transformers, and distribution related feeders should significant load growth occur in the area.

H. Use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries.

The Proposed Route parallels existing roads (180th Avenue, County Road 256/133rd Street and 195th Avenue), existing transmission and distribution line rights of way, and natural division lines for the majority of its length. The Proposed Route will cross two parallel pipelines. The Applicants will work with the pipeline owner to identify and mitigate issues (Section 8.2.9).

I. Use of existing large electric power generating plant sites.

This criterion is not applicable.

J. Use of existing transportation, pipeline, and electrical transmission systems or rights-of-way.

See the comments under part H above.

K. Electrical system reliability.

Crow Wing Power, along with the Applicants, serve the electric needs of the Little Falls area. The purpose of the proposed Project is to address low voltage and equipment overload concerns that threaten to jeopardize reliable electrical service to the consumers in the rural areas east of U.S. Highway 10 and Minnesota State Highway 371, including the cities of Pierz, Genola, Lastrup, and Buckman. If voltage cannot be maintained within acceptable limits, electrical appliances and lighting will not perform as expected and could potentially be damaged. Additionally, overloaded equipment is susceptible to failure, which could lead to long-term outages if switching cannot be performed to restore service.

L. Costs of constructing, operating, and maintaining the facility which are dependent on design and route.

The cost of constructing, operating, and maintaining the facilities along the Proposed Route are shown in Table 3-1 and are similar to the rejected alternative routes. The Proposed Route parallels existing rights of way to the extent technically and economically feasible. This reduces the cost of acquiring easements and right of way preparation.

M. Adverse human and natural environmental effects which cannot be avoided.

The only identified environmental effects that cannot be avoided are primarily short-term during the construction of the lines and the upgrade of the substations. If any archaeological sites are identified during placement of the poles along the Proposed Route, work will be stopped and the MHS will be consulted. Native vegetation that is compatible with the operation and maintenance of the transmission lines will be maintained within the Proposed Route. If required, native species will be planted or seeded in areas that are devoid of native species.

Soils will be revegetated as soon as possible to minimize erosion or some other method will be used during construction to prevent soil erosion. During construction temporary guard or clearance poles are installed at crossings to provide adequate clearance over other utilities, streets, roads, highways,

railroads, or other obstructions after any necessary notifications are made or permit requirements met to mitigate any concerns with traffic flow or operations of other utilities.

N. Irreversible and irretrievable commitments of resources.

The Project does not require any irreversible or irretrievable commitment of resources. Should the lines and/or substations be abandoned and removed at some time in the future, there is nothing related to their earlier placement that would prevent or require a different use of resources in the future.

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APPENDIX A

COMMISSION AND AGENCY CORRESPONDENCE

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APPENDIX C

NAMES OF PROPERTY OWNERS ALONG THE PROPOSED ROUTE

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